

THE
CHILDREN'S LIBRARY
OF
WORK AND PLAY



GUIDE AND INDEX
CHESHIRE L. BOONE

THE
IB
belor

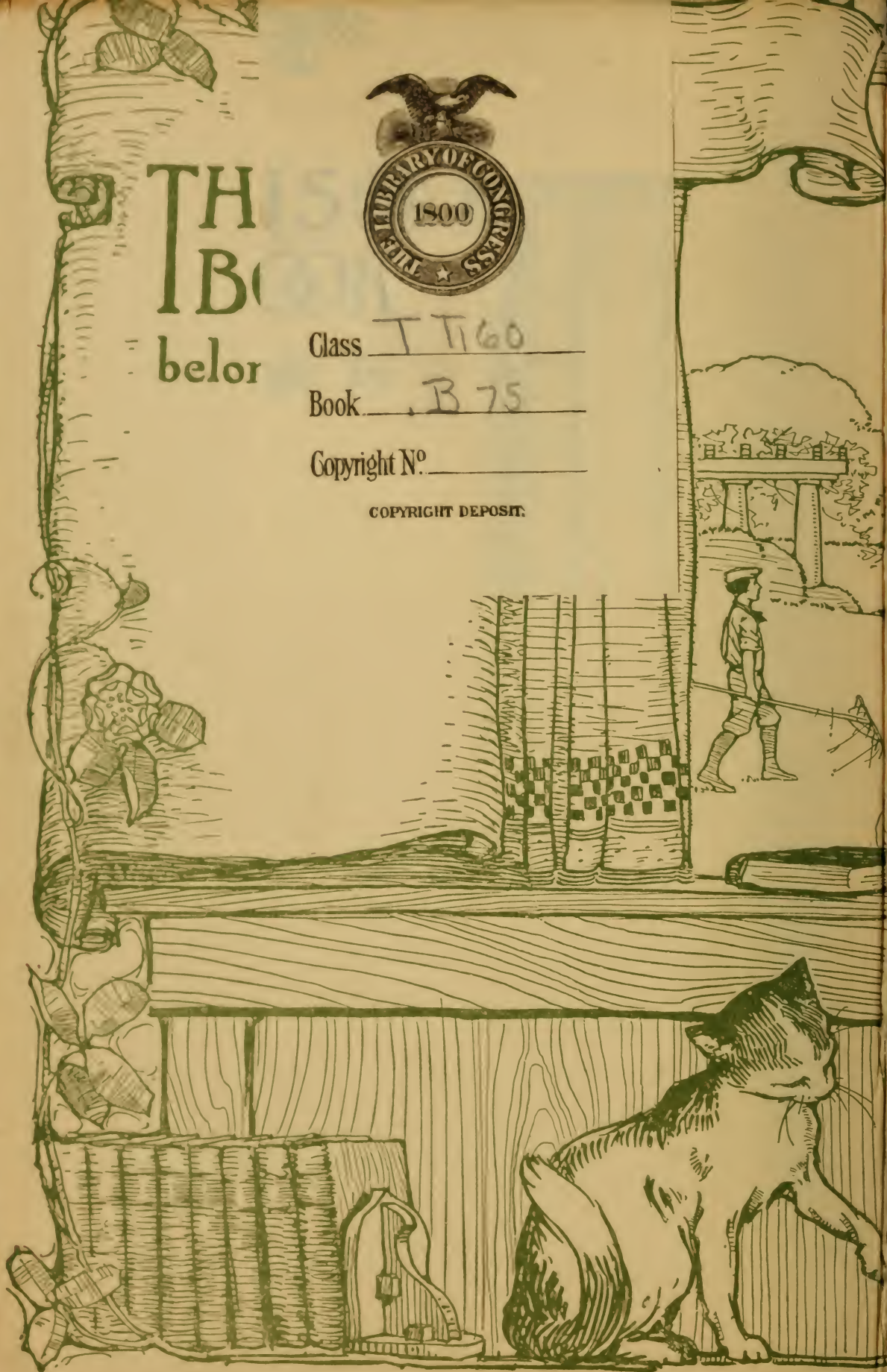


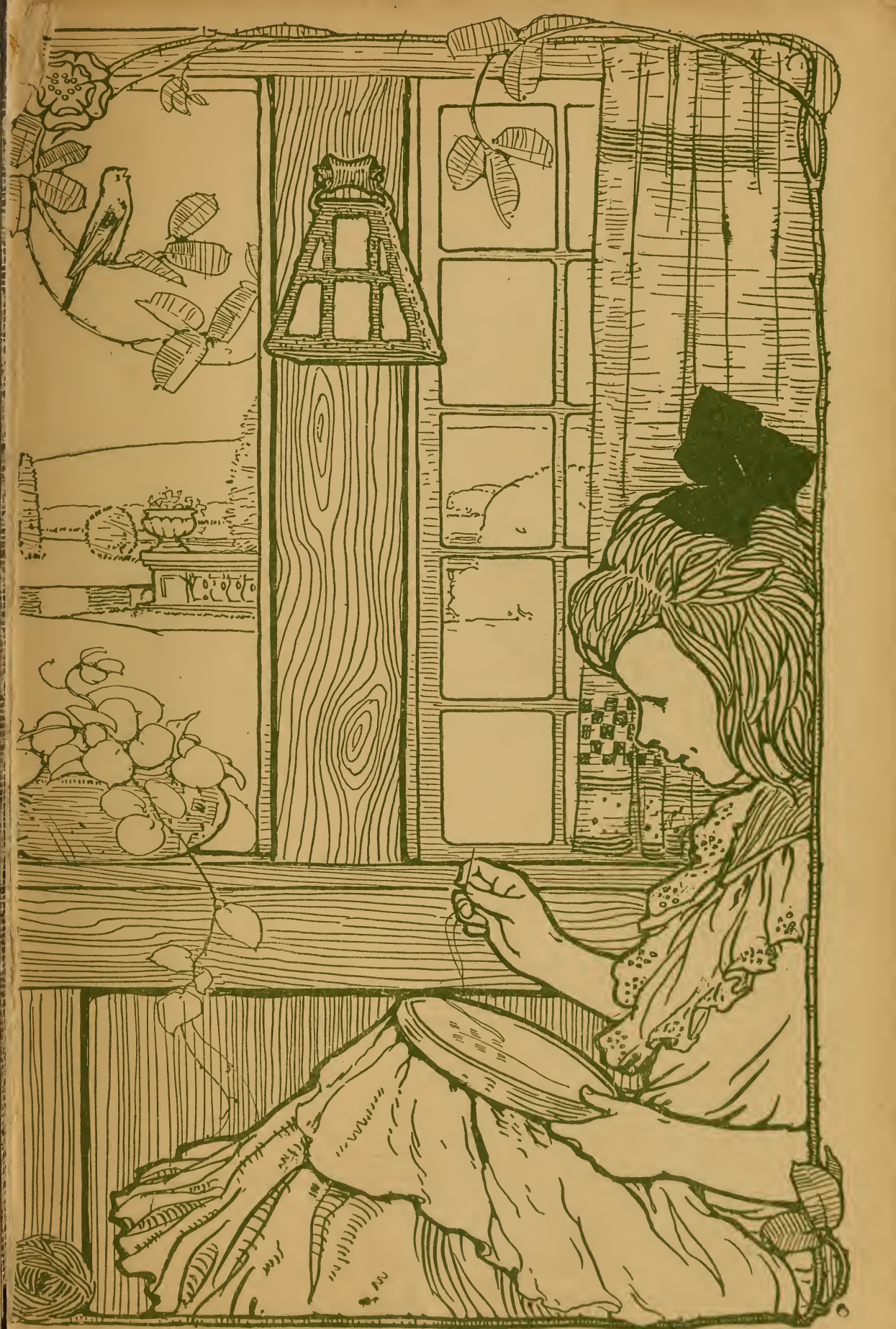
Class T T60

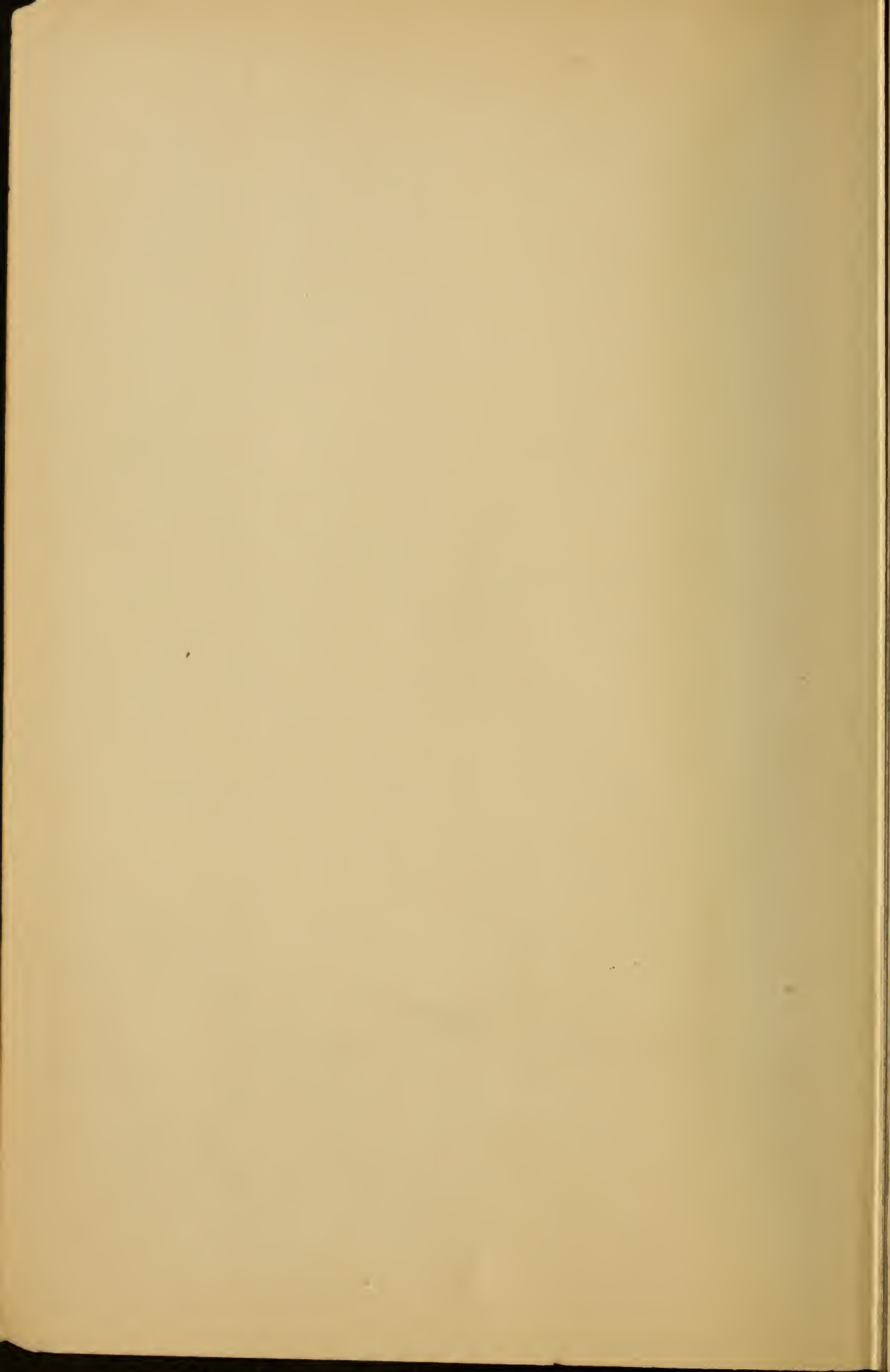
Book B 75

Copyright N^o _____

COPYRIGHT DEPOSIT.







THE LIBRARY OF WORK AND PLAY
GUIDE AND INDEX

THE LIBRARY OF WORK AND PLAY

C CARPENTRY AND WOODWORK
By Edwin W. Foster

ELECTRICITY AND ITS EVERYDAY USES
By John F. Woodhull, Ph. D.

GARDENING AND FARMING
By Ellen Eddy Shaw

HOME DECORATION
By Charles Franklin Warner, Sc. D.

HOUSEKEEPING
By Elizabeth Hale Gilman

MECHANICS, INDOORS AND OUT
By Fred T. Hodgson

NEEDLECRAFT
By Effie Archer Archer

K OUTDOOR SPORTS AND GAMES
By Claude H. Miller, Ph. B.

A OUTDOOR WORK
By Mary Rogers Miller

WORKING IN METALS
By Charles Conrad Sleffel



Wireless Station and Workroom of George Riches, Montclair, N. J. George made most of the Apparatus at Home or in the School Shop

The Library of Work and Play

GUIDE AND INDEX

By CHESHIRE L. BOONE



GARDEN CITY NEW YORK
DOUBLEDAY, PAGE & COMPANY
1912

ALL RIGHTS RESERVED, INCLUDING THAT OF TRANSLATION
INTO FOREIGN LANGUAGES, INCLUDING THE SCANDINAVIAN

COPYRIGHT, 1912, BY DOUBLEDAY, PAGE & COMPANY

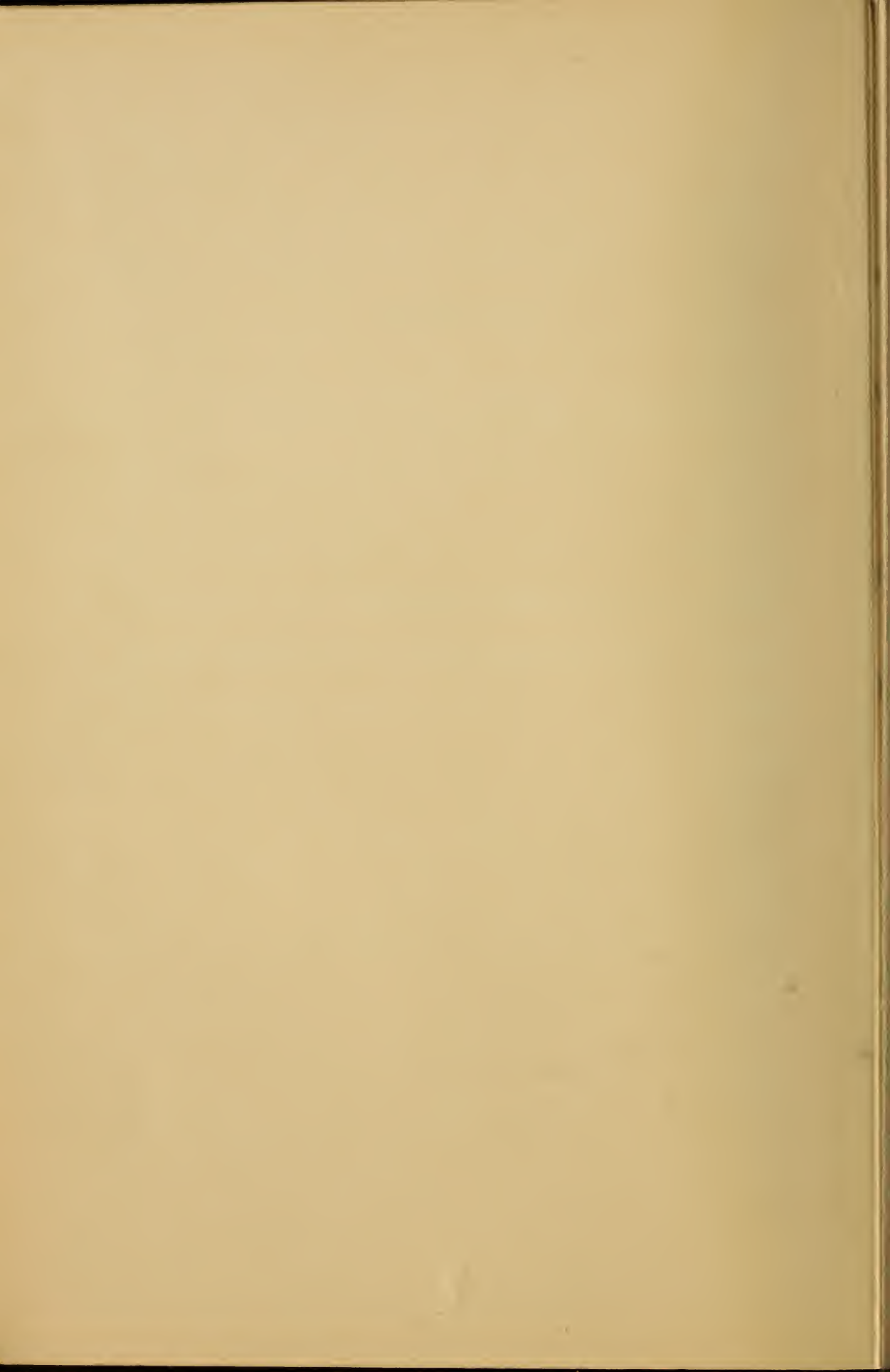
TT160
B75


THE COUNTRY LIFE PRESS, GARDEN CITY, N. Y.

CL A319698

CONTENTS

CHAPTER	PAGE
I. SIGNIFICANCE OF THE CRAFTS IN THE LIFE OF A PEOPLE . . .	3
II. THE CULTIVATION OF TASTE AND DESIGN	16
III. THE REAL GIRL	28
IV. THAT BOY	47
V. A HOUSE AND LOT—ESPECIALLY THE LOT	67
VI. VACATIONS, ATHLETICS, SCOUTING, CAMPING, PHOTOGRAPHY . .	78
INDEX	85



LIST OF ILLUSTRATIONS

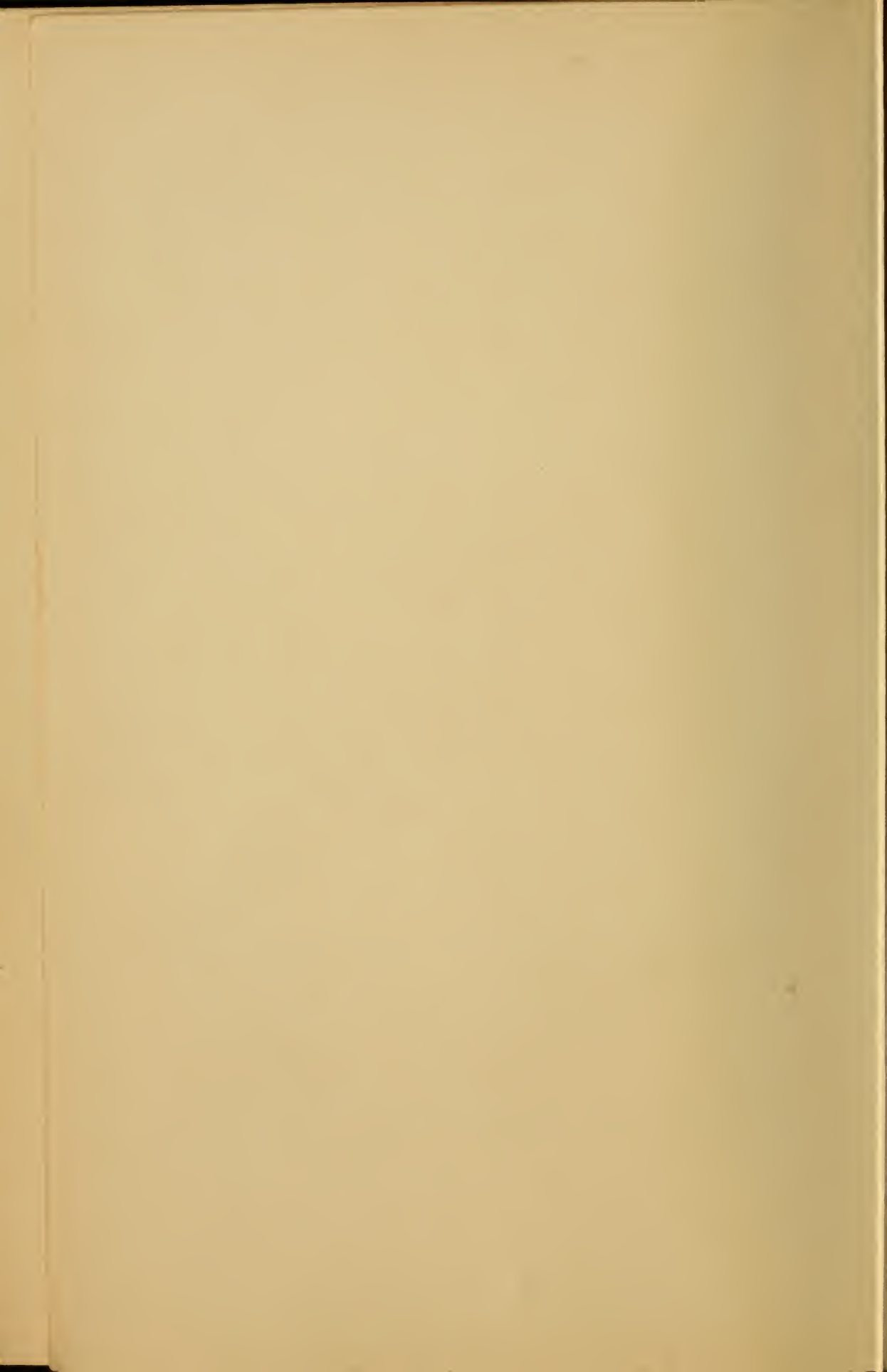
Wireless station and workroom of George Riches	<i>Frontispiece</i>
	FACING PAGE
An example of furniture such as boys like	4
Clay pots made for germination experiments	5
The work of children between ten and eleven years of age	5
Two examples of furniture grouping for the porch or outdoors	18
The numerous photographs suggest disorder and dust	19
An interesting curtain which might be duplicated by any girl	20
Since flowers are so beautiful in themselves, is it not worth while to arrange them with judgment?	21
A school garden in Jordan Harbour, Ontario, Can.	28
Domestic science class	29
The work of girls in the public schools	30
A children's garden gives fresh air and sunshine	31
All children love to play at being "grown up"	32
Girls must sometime learn of the conventions and customs of domestic arrangement	33
A boys' camp with Ernest Thompson Seton	48
The play idea very soon grows toward the represen- tation of primitive though adult customs and actions	49
A typical boy's workroom and shop	50

The kind of shop which one may have at home . . .	51
The kite fever is an annual disease	52
Pump and waterwheel	53
Boat made by Percy Wilson and Donald Mather . .	54
These are the forerunners of numerous other electrical constructions	55
A real derrick in miniature	56
Waterwheels and fan	57
A self-recording telegraph receiver	58
Wireless station and workroom of Donald Huxom .	59
An electrical soldering iron and glue-pot	60
Waterwheel connected with model lathe	61
Excellent examples of high school work	62
A manual training shop	63
The machine shop	64
The study of aeroplane construction	65
A successful machine	64
Finished aeroplanes	65
The boy who does not love to camp is unique . .	68
This and other illustrations of homes, show such places as people make when they care about appearance	69
Even the most beautiful house must have a background	70
One should build a house as one builds a reputation	71
Trees, shrubbery and lawn form the frame of the picture	72
There was a time not long since, when people built houses according to style	73
A school garden	74
The Watchung School garden	75
There is a fascination about raising animals whether for sale or as pets	76

LIST OF ILLUSTRATIONS

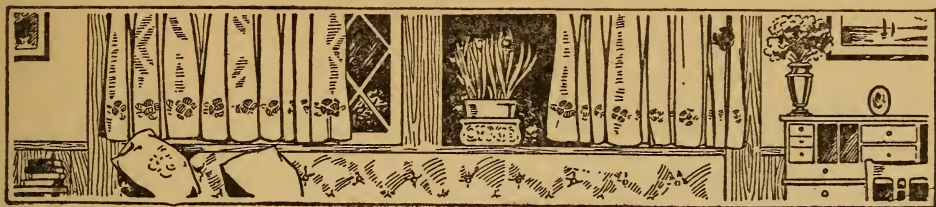
ix

Two more illustrations which will suggest plans for the future	77
Every child, and especially the boy, needs active outdoor exercise	78
Organized play (woodcraft) under Ernest Thomp- son Seton	79
More woodcraft. Has the boy had a chance at this kind of experience?	80
Even the technical process of photography has been reduced to popular terms	81
In these days photography has become so simplified that every child can use a camera to advantage	81



THE LIBRARY OF WORK AND PLAY
GUIDE AND INDEX





CHAPTER I

SIGNIFICANCE OF THE CRAFTS IN THE LIFE OF A PEOPLE

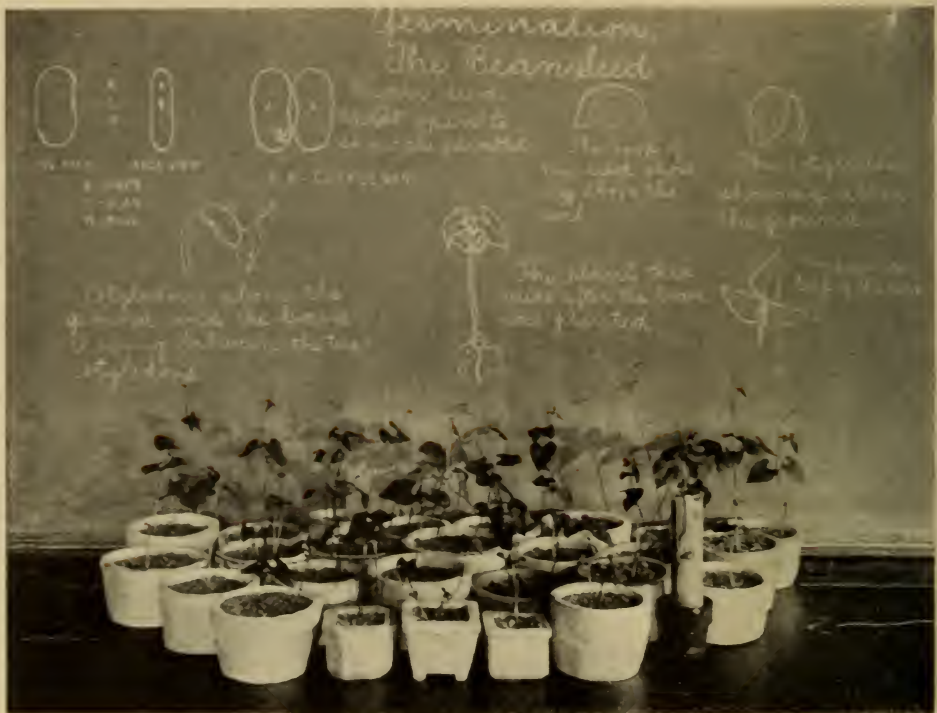
THERE was never a time in the history of the world when each race, each nation, each community unit, each family almost, did not possess its craftsmen and artists. In every instance, these so-called gifted members were by no means the least important citizens; their names appeared again and again in the stream of tradition as wonder workers and idols of the people. This is still true in the very midst of a materialistic age, when money and mechanics work hand in hand to produce the most in the least time for economic reasons, and when the individual worships "hand-made things." They may even be poorly made or bizarre, but "handwork" satisfies the untutored. Now it is quite possible for the machine to produce a bit of jewelry, textile, or woodwork — even carving — quite as pleasing as any made by hand alone, and it is being done every day. But the machine-made

article must be produced in large quantities (duplicates) for profit, whereas the work of hand alone is unique. There lies the reason for reverence of "handwork." It is always individual and characteristic of the workman in style or technique and has no duplicate; it is aristocratic. Among the primitives, the pot, necklace, or utensil was wrought by infinite labor, and, being valuable because unique, was embellished with all the wealth of current symbolism. It was preserved with care and became more valuable to succeeding generations as a tangible record of race culture and ideals. And so down to the present time, the handiwork of the craftsman and skilled artisan has always stood as the one imperishable record of racial development. The degree of finish, the intricacy of design and nicety of construction are evidences of skill and fine tools, well-organized processes, familiarity with material and careful apprenticeship: the pattern, color, ornament, and symbolism point to culture, learning, and standards of taste and beauty. A crude domestic economy, rude utensils, coarse, garish costume and of simple construction, are characteristic of an undeveloped social order. In fact, all the arts of both construction and expression exhibit at a given period the degree of civilization;



Copyright, 1909, by Cheshire L. Boone

An Example of Furniture such as Boys Like and which They Can Make Under Direction



Copyright, 1909, by Chesire L. Boone

Clay Pots Made for Germination Experiments in Grade IV. of the Public School. The Boys of this Grade Built a Small Kiln in which these Pots were Fired



The Work of Children between Ten and Eleven Years of Age

art products are true historical documents. Since then through their arts and crafts it is possible for one to know a people, does it not follow that one entrance to sympathy with the ideals and taste of the present time is through practice in the arts? Of course a considerable mass of information about them can be conveyed in words, especially to adults who have passed the formative period in life and have not the same *work*-incentive as have children. But even the adult never really secretes much real knowledge of the arts unless he has worked in them. He acquires rather a veneer or artistic polish which readily loses its lustre in even a moderately critical atmosphere: he learns artistry and the laws pertaining thereto as he would learn the length of the Brooklyn Bridge or the population of El Paso. He merely learns to talk about art. But children learn primarily and solely by *doing*, and the foundations of taste and culture need to be put down early that they may build upon them the best possible superstructure which time and opportunity permit.

The foregoing paragraphs will perhaps have opened the way for questions: "What kind of knowledge is of most worth? Why do children — practically all of them — try to make things, and what is their choice?" And when these queries have been an-

swered so far as may be, do the answers possess immediate value?

At the outset it will be evident that no sort of knowledge will be of much avail until it is put in such form that the student can use it to advantage. Mere knowledge of any kind is inherently static — inert and often seemingly indigestible, like green fruit and raw meat. One too frequently meets college graduates, both men and women, equipped with so-called education, who are economic failures. These people are full of information, well up to date, but they seemingly cannot use it. Their assortment of knowledge is apparently in odd mental sizes which do not fit the machinery of practical thinking as applied to life: it is like gold on a desert isle. What the boy and girl need and desire is (1) a favorable introduction to the sources of information, and (2) the key to its use. They will have to be shown simple facts and truths, and have their mental relations and importance explained. By gradually introducing new knowledge as occasion offers, the field of study is sufficiently widened. Children profit little by books and tools alone: they crave encouragement and some direct constructive criticism. In such an atmosphere their endeavors become significant and profitable, and the accumulated

learning will be applied to business or economic ideas which result in progressive thinking, which uses information as a *tool*, not an end in itself.

If then the arts of a people stand as monuments to its beliefs and ideals, an intimate understanding of some of the arts ought to be provided for in every scheme of education both at home and in school. The child is by nature interested in the attributes of things associated with his life and upbringing. He wants to know about them, how they are made, and learn their uses by means of experiment. The elements of science, mechanics and natural phenomena, business and household art, and finally play (which is often adult living in miniature) — these comprise a large portion of the subject matter which is of prime importance to children. It is just such material as this which bids fair to serve in the future as the basis for public school curricula, simply because of its strong appeal to youth and its potential worth in forming the adult.

The boy makes a kite, a telegraph outfit, or sled in order to give to his play a vestige of realism. He seeks to mold the physical world to personal desires, as men do. Incidentally he taps the general mass of scientific facts or data and extracts therefrom no small amount of very real, fruitful informa-

tion. The result possesses marvelously suggestive and lasting qualities because it came through effort; because the boy wanted above all things to see his machine or toy *work, move*, or obey his guiding hand, he was willing to dig for the necessary understanding of the problem. His study brought about contact with numerous other lines of work which were not at the time, perhaps, germane to the subject, but were suggestive and opened various side lines of experiment to be considered later. Therein lies the lure of mechanics and craft work, gardening, outdoor projects, camping, etc.: the subject is never exhausted, the student can never "touch bottom." There is always an unexplored path to follow up. The intensity of interest in mechanical things and in nature is the one influence which can hold the boy in line. Turn him loose among mechanical things where nicety of fitting and accurate workmanship are essential and he appreciates construction immediately, because it is clear that *workmanship* and *efficiency* go hand in hand. It is very much the same with the girl: she may not enjoy the tedium of mere sewing, but when the sewing serves a personal end, when sewing is essential to her greatest needs, these conditions provide the only, inevitable, sure stimulus to ambition and effort.

The school of the past, and often that of the present, has sought to produce the adult by fertilizing the child with arithmetic, grammar, geography, and language. The process resulted in all kinds of crooked, stunted, oblique growth, the greatest assortment of "sports" (to use a horticultural term) the world has ever seen. It isn't intellectual food the child needs most (though some is very necessary); the real need is intensive cultivation. Within himself he possesses, like the young plant, great potential strength and virility, enough to produce a splendid being absolutely at one with his time and surroundings; he simply requires the chance to use the knowledge and opportunities which lie at hand. It is, then, the common subjects of every-day interest — science, business, nature and the like — which are the sources of knowledge which has greatest worth to children.* They are the valuable ones because they are of the type which first attracts and holds the child's attention; they are concrete. Through them one may learn language and expression, because one has something worth saying.

The second question, "Why do children like to make things and what is their choice?" in the light

* For the elaboration of this question as it concerns girls see Chapter IV.

of what has been said practically answers itself. Children work primarily in response to that law of nature which urges the young to exercise their muscles, to become skilful and accurate in movement, for the sake of self-preservation and survival. It is another phase of the same law which makes one carry out in work, in concrete form, the ideas which come tumbling in from all conceivable sources. The child can only think and learn in terms of material things. Finally, the child's interests, the things he desires to make and do, are such as will minister to his individual or social needs, his play and imitation, and such as will satisfy his desire to produce articles of purpose. The need may be a temporary, minor one, but every child is stubborn on this one point, that everything he does must lead to utility of a sort; through such working with a purpose he in time rises to an appreciation of beauty and other abstract qualities.

Now this complex condition of child and school and society, in which there is seemingly so much waste — "lost motion" — has always existed; the facts are not new ones by any means. It is a condition where the child is always curious, inquisitive and ready to "hook a ride" on the march of business, science and learning, but the school sternly com-

mands "learn these stated facts because they are fundamental" (philosophically), while society, represented by the parent, alternately abuses the school, which is collectively his own institution, or spoils the child by withholding the tools for learning easily. In the meantime the child, with the native adaptability and hardiness of true need, thrives in barren, untoward surroundings, and matures notwithstanding. In other words, the school and society have always tended toward misunderstanding — toward a lack of mutual interest. In this period of uncertainty, of educational groping, the child is found in his leisure hours pushing along the paths which connect most directly with life and action, shunning the beaten but roundabout highways of custom and conservatism.

The deductions are evident and clear-cut. If one accepts the foregoing statement of the case, and there is ample evidence in any community of size, it will be clear that certain definite opportunities should be opened to the boy or girl to make the most of native talent and enthusiasm. Encourage the young business adventurer or artisan to make the most of his chosen hobby (and to choose a hobby if he has not one already), to systematize it, develop it, make it financially profitable if that is the desire;

but first, last and all the time to make it a study which is intensive enough to satisfy his or her productive ambitions. At this age (up to the high school period) the boy or girl may not have been able to decide upon a profession or business, but he is working toward decision, and he is the only one who can choose. Instead of trying to select an occupation for him, father and mother would do well to put the child at the mercy of his own resources for amusement, recreation and business, merely lending a hand now and then in their full development. It will preserve the freshness of youth beyond the ordinary time of its absorption by a blasé attitude toward the world, and lead toward a more healthy and critical kind of study than the haphazard lonesomeness, or the destructive gang spirit of the modern community.*

Perhaps it would not be amiss to indicate just how this unofficial study may be promoted, and to name the resources of the parent for the purpose. First of all, nine children out of ten will definitely choose a hobby or recreation or indicate some preference, as photography, animal pets, woodwork, electricity, drawing, sport, one or more of the

* Both boys and girls have clubs, societies and organizations, which are useless, enervating or merely harmless when they exist without purpose. If, on the other hand, the aggregate energy can be collected into profitable channels, these same gangs or societies are a real source of education and training. Any organization without consistent, sustained purpose is a waste of social energy. Baseball is worth while, but the merits of high school fraternities are doubtful.

domestic arts, collecting coins, stamps, etc.; there are as many tastes as children. The child may get his suggestion from the school or companions. Any legitimate taste should be actively encouraged and supplemented by books which really explain and by tools and materials with which to use the books. If it is a shop he wants, try to give him the use of some corner for the specific purpose so that the occupation may be dignified according to its juvenile worth. Second, endeavor to emphasize the economic and social significance of the work done and urge right along some definite aim. If a boy wants a shop, or pets, see that they are kept in condition, attended to, and if possible give some measure of tangible return on the outlay of money and energy. Third, connect the boy's or girl's chosen avocation with real living in every possible manner. Girls are rather fond of those decorative arts which contribute to artistic pleasure, and should they make experiments with stenciling, block-printing, and the like, have them use them also in embellishing their own rooms, the summer camp or club. Fourth, make the child feel that a given hobby is not to be satisfied for the mere asking. Put some limit on the money expenditure until it is clear that the interest is genuine and honest, and that the child

is either producing results which are sincere, or acquiring real knowledge. Fifth and last, but perhaps most important of all, support the school in its effort to solve the problem of formal education, because the heavy burden rests there. It is quite essential that the home give the boy and girl every possible chance to develop along original and specific lines at their own pace, to experiment with the world's activities in miniature, and establish the probable trend of individual effort for the future. But this can only supplement and point the way for the formal training which the institution (school) gives. The school, being democratic and dependent upon the general public for existence, takes its cue therefrom, and creating ideals in consonance with public needs perfects the method of reaching them. When father and mother believe in a vigorous, efficient education, rooted deeply in the child's fundamental attitude toward the world and its affairs, then will the public approve and urge the proper kind of organized training. Even so, the school cannot really educate the child—he educates himself through the agents aforementioned—it simply organizes information and gives the pupil access to methods of using facts and ideas.

In closing this chapter there is one more word to be said concerning the main theme. The arts and crafts* of expression and construction fulfil that precise function in the child's preliminary training which they did in the early history of the race. They indicate just that degree of manual skill and constructive ability of which both the youthful individual and the young race are capable; they serve as indices and guides to the development of design, taste and constructive thinking. As the child matures he may elevate a given craft to an art or science, but the early familiarity, the simple processes, he should have, because they are essential to childhood. Hence, the large amount of handwork in the kindergarten and primary school; it is the necessary complement to academic work and balances the educational diet.

* It will be evident that the term *crafts* as here used is a more comprehensive term than when employed in connection with the arts and crafts furore of the past few years. Any kind of manual occupation may be a craft; if it involves a measure of art and science it may become more than a craft. But with children the craft stage, which is characteristic, includes many occupations which may not even be true crafts as the term is ordinarily used.

CHAPTER II

THE CULTIVATION OF TASTE AND DESIGN

IT WILL be evident to the thinking man or woman that art or any phase of it is not to be taught successfully as a profession through books. The very most that one can expect from reading is a knowledge about art matters and acquaintance with the conventions and rules which obtain therein. But even this slight result may be the precursor of a fuller, more intimate familiarity with the principles of good taste and design.

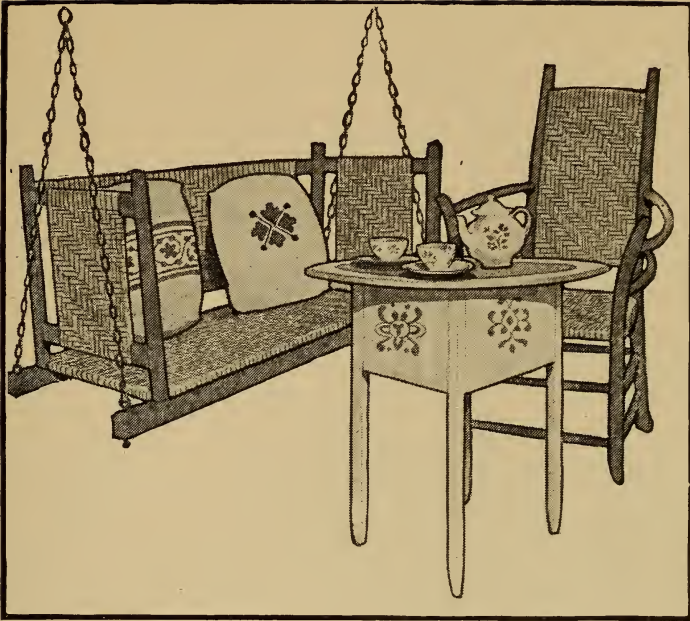
One may be able to say "that is a beautiful room" or "a fine garden" or "a charming gown" and yet be unable to produce any such things. How is it possible then to *know* if one cannot *do*? The answer is that, *potentially*, every individual who really sees and appreciates beauty can produce it through some form of artistic expression; the power to execute and the power of invention are merely undeveloped. And as for the artist or craftsman who can make beautiful things, but who cannot

explain how he does it — he is unique, like the mathematical genius; he just sees the answer; it is a gift. Though there are born in every generation a few with the divine spark of genius, the mass of men and women has always learned by effort. In other words, it has been possible to *teach* the subjects which were found necessary to culture and education; it is quite possible to present the ordinary phases of art to the lay mind in such a way, even through books, that one may have worthy ideals, and a healthy point of view. The present chapter will be devoted to showing how books such as these* for boys and girls can contribute to the development of taste.

Frankly, taste has much less to do with fine art than with the arrangement and choice of the ordinary externals of living. Of course fine art does in the last analysis pass judgment upon form, color and design in clothes, furnishings and architecture, but the common home variety of taste is derived directly from custom, comfort, and convention, not from art at all. Only in the later stages of refinement does the lay mind succumb to direct supervision by art. On the other hand, all conventions and ideals are the result or sum total of general experience, in

* Library of Work and Play.

which art has played its part, and has left some impress on the individual, giving rise to belief in a few principles so common as to be accepted by all. Principles of this kind are not always serviceable or effective, because they are not stated in precise language, and cannot therefore become standard. In truth, so far as design is concerned, there are very few absolute rules for guidance, and a book like "Home Decoration" cannot tell the child or parent how to make a beautiful, inspiring home. Its mission is to create the desire for fine surroundings, to suggest ways and means for studying design, especially those phases of decoration associated with the crafts, and above all such a book invites and helps to maintain a *receptive attitude* of mind toward artistic matters. In the effort to produce work of merit, one becomes critical, and seeks reasons and precedents for judgment. This is the beginning of design study: and the fact that one has real interest in taste is indicative of the desire of the cultured mind for ideals. If a child is allowed to grow up in the "I know what I like" atmosphere, without reasonable contact with choice things, and without the necessity for selection based upon reason, there is small chance that such a child will ever acquire any sense of fitness or taste in material surroundings.



Two Examples of Furniture Grouping for the Porch or Outdoors. These Few Pieces Suggest Comfort, Cleanliness and Moderate Expense



The Numerous Photographs in the Upper Illustration Suggest Disorder and Dust. They do not Decorate. Sometimes a lack of Small, Insignificant Objects like these is the Secret of Successful Decoration

The aims of all practical books for boys and girls may be summarized about as follows:

(a) To absorb the overflow of youthful energy and turn it into profitable channels.

(b) To develop organized thinking and accomplishment, and eliminate wasted, aimless, non-productive action. This is the complement to the routine of formal training in academic subjects, which are in themselves, normally un-useful.

(c) To explore the field of accomplishment in order to select intelligently a future occupation.

(d) To develop and foster standards and ideals of efficiency, comfort, enjoyment, beauty and social worth. This last purpose includes taste and is the one of concern here.

The peculiar æsthetic standards which interest young people are of the most practical kind. They apply every day and to everybody. And they are fundamental. The illustrations given below will indicate the common-sense way in which design should be approached:

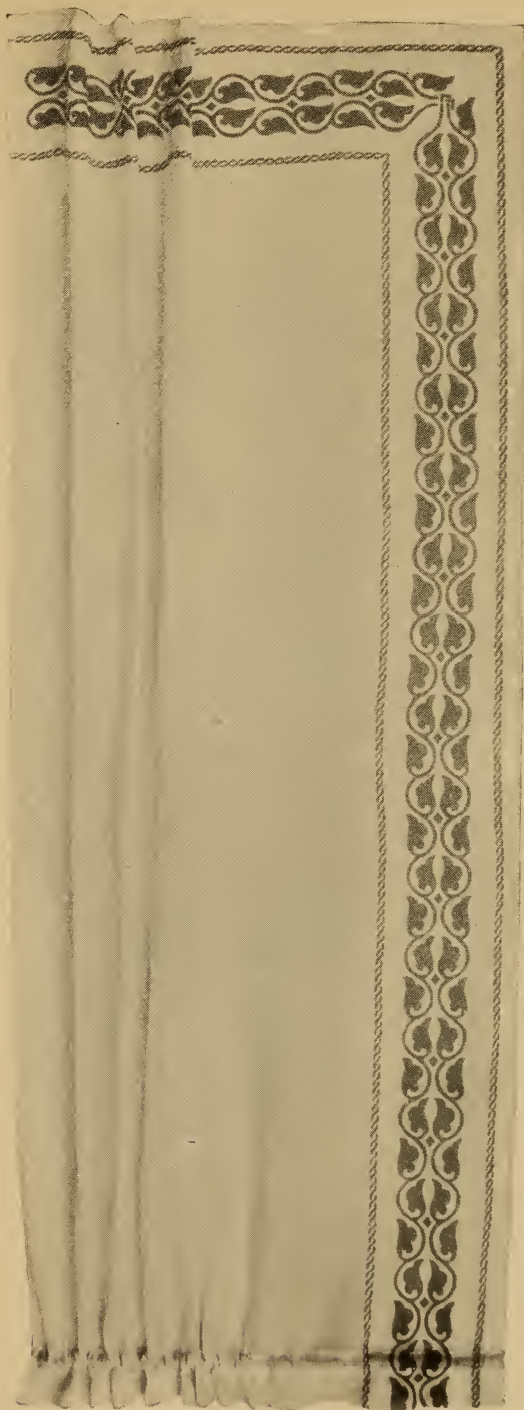
Color. The tones of the color scale have not yet been systematized so well as those of music, but each year students of design and artists move a little toward agreement. Now, suppose one wishes to use two or more tones in a room, how may

harmonious effect be secured? The very word "harmony" means *agreement*, and suggests *similarity, likeness, relationship*. Therefore the tones one would use in the embellishment of a room should possess some common *quality* for the harmonizing element. Each tone having that quality as characteristic is similar in that one respect to all other tones having the same quality. Hence they are related in a way. The relation may be made strong or weak by the manipulation of the bond which holds the tones together. For instance:

Red and green are not related at all. By mixing gray with each, red and green become related through gray. By mixing yellow, orange or blue, etc., with red and green, the relationship may be established in the same way.

Yellow and green have a common quality — *yellow*, and in so far tend toward harmony. But it may not be a pleasing one, and it will be necessary to bring them still closer together by introducing other bonds, as gray or a color. Yellow is very light and green is dark: they will work together better if brought nearer together in value.

It is by such simple means that all color combinations are brought into line and rendered satisfactory. No rule can be given for mixing or choosing the actual



An Interesting Curtain which might be
Duplicated by almost any Girl — If She
Wanted Curtains



Since Flowers are so Beautiful in Them-
selves, is it not Worth While to Arrange
Them with Judgment?

colors, but it is a safe rule to select those of a kind in some respect. The popular belief in low-toned (grayed) color schemes is a sound one, and the principle can be used very comfortably by the amateur decorator in furnishing a home. She can have any colors she wishes, and make them pleasing, if she will unite them by some harmonizing tone. Of course, all grays even are not rich and beautiful, but they are better than unadulterated color. Mr. Irwin in one of his breezy skits quotes the æsthete as saying: "Good taste should be like the policeman at parade; he should permit the assembled colors to make an orderly demonstration but not to start a riot." The moment the unskilled amateur tries to use white woodwork, red wallpaper, and gilt furniture in combination, he or she courts failure simply because the choice lacks the pervading tone which would modify the three. There are ways to secure harmony even under the most adverse conditions, but the technical details are not pertinent here.

Another characteristic which stands in the way of harmony is *emphasis*. The moment any one tone becomes greatly *different* from its neighbors in value or otherwise, it stands out, attracts attention, just as in material objects, unusual, curious shapes

and sizes invite notice, often beyond their just dues. Hence a brilliant yellow house, a bright green gown, large figured wallpaper, are over-emphatic. Clothes, which by their color and style are loud in their clamor for inspection, are out of key and bear the same relation to surroundings which foreign, exotic manners and customs bear to domestic conventions. And ordinarily one does not seek such prominence.

This question of taste is a vital one to children, and these books about "Needlecraft," "Home Decoration," "Outdoor Work," "Gardening," etc., are indirectly most useful because they put the child in a *position to choose*. The girl who sews and helps run the home is bound to cross the path of design a dozen times a day. She is faced with problems of arrangement, color and utility at every turn. Her own clothes, her room, the porch and garden, whatever she touches, are inert, lifeless things which await artistic treatment. It is when the child is faced with the problem of personal interest and pleasure that these elementary conceptions of design may be proposed.

Form and Line. Each year fashion decrees for both men and women certain "correct" styles. At slightly longer intervals the shops offer new models of furniture, hangings, jewelry, pottery, etc. Have

these new things been devised to meet a change in public taste? Not at all; they are inventions to stimulate trade. Most of such productions are out of place, incongruous, in company with present possessions. One must have a pretty sound sense of fitness and selection in order to use them to advantage or to resist their lure. As single examples, many of the new things are beautiful in color and line, though they may have nothing whatever in common with what one already owns.

One chooses a given pattern in furniture first, because of its *utility*; second, because of its harmony in line and size with other furniture already owned; and third, because of its intrinsic beauty. It is much less difficult to furnish a house throughout than to refurnish an old room in consonance with others already complete. All the household things need not be of one kind, though the closer one clings to a clear-cut conception of harmony (relationship of some kind) the better the result. Hence clothes may either beautify or exaggerate personal physique, and the garden may attach itself to the house and grounds or stand in lonely, painful isolation. Down at bottom design aims to assemble elements and parts into proper groups, and in the common questions of home decorations and dress the student can

usually work on just that simple basis. It is usually the incongruous, over-prominent, conspicuous, or isolated factor in decoration which causes trouble.

This fragmentary discussion will perhaps suggest some of the benefit which may come from the pursuit of crafts and occupations. The illustrations here given are in some detail because it is so easy to overlook design at home and in common things. Everything is so familiar there, one is so accustomed to the furniture, rugs and their arrangement, that it never comes to mind that the situation might be improved. It must be remembered that, when children begin to apply design to their own handicraft, their fundamental conceptions of beauty originate in the home. Either the children must lose faith in home taste, or, as they grow and learn, be allowed to bring their new-found knowledge back into the home and "try it on." This is where the craft does its real work. The true privilege conferred upon children by the possession of such books as these on various special occupations is a chance to obtain, first-hand, individual standards of perfection and beauty. Before this they have merely accepted the home as it stood, with no thought of what was choice or otherwise.

Since taste and design are merely implied, or

indirectly included in the several volumes, save "Home Decoration," the latter should be used as a supplementary reference in connection with the others. As has already been said, it is not possible or advisable to systematically teach good taste. It will be better and more effective to just *include* taste in the several activities the child undertakes. When the girl begins to make things for herself, help her to select materials which are appropriate in every way. Have her seek materials for the purpose. Have her *choose* decoration and color rather than take the first handy suggestion or copy the plans of another. She would do well to experiment independently. The girl should create her own room down to the last detail, not make everything herself, but plan it, plan its arrangement, its color (tone) if possible, and make those small decorative articles like pillows, runners, curtains, etc. But before beginning such a comprehensive experiment in decoration have her look about a bit and note the conditions imposed. The light and exposure, size of the room, furniture which must be used, treatment of hangings — these are all stubborn factors, but they respond to gradual treatment. Then the room is hers in reality. The boy's attitude toward taste is totally different. He cares less than

the girl for the charm of tone and arrangement; he is quite willing to despise the niceties of decoration. He must approach the question obliquely through interest in the efficiency of a given effort; he appreciates the utility phase of design most of all. The boy will come to see gradually that his pets and chickens should be decently housed, and that it is good business to do so. He should not be allowed to impose upon his own family or their neighbors a slovenly yard or garden. He will find that those tools work best which are sharp and clean and always in place. His final lesson in design grows out of association with his mates. When he begins to go to parties, to enter the social world in a small way, a new body of conventions in taste appear and he must be taught to appreciate them if he would be well liked. But the real training in design arises from manual work — the playthings, toys and utensils the boy makes for *use*. They need not be beautiful nor is there excuse for clumsiness in construction. One cannot expect even the mature child to take much interest in design in the abstract, but when he meets the subject on a common-sense basis, as a part of some personal problem, design — even taste in color and form — acquires definite standing in his esteem. It has earned the right.

Hence a liberal contact with youthful amusements and occupations encourages both boy and girl to build ideals of working, and among these ideals taste is bound to appear in some guise — usually unbidden. The book on design or decoration is but a reference, an inspiration, a stimulant, never a text of instruction. The ability to choose, to secure appropriate, beautiful, accurate results, is largely a by-product of judicious reading combined with persistent effort. It remains for the parent to skim off this by-product as it appears and infuse a little of it into each problem the child presents for inspection.

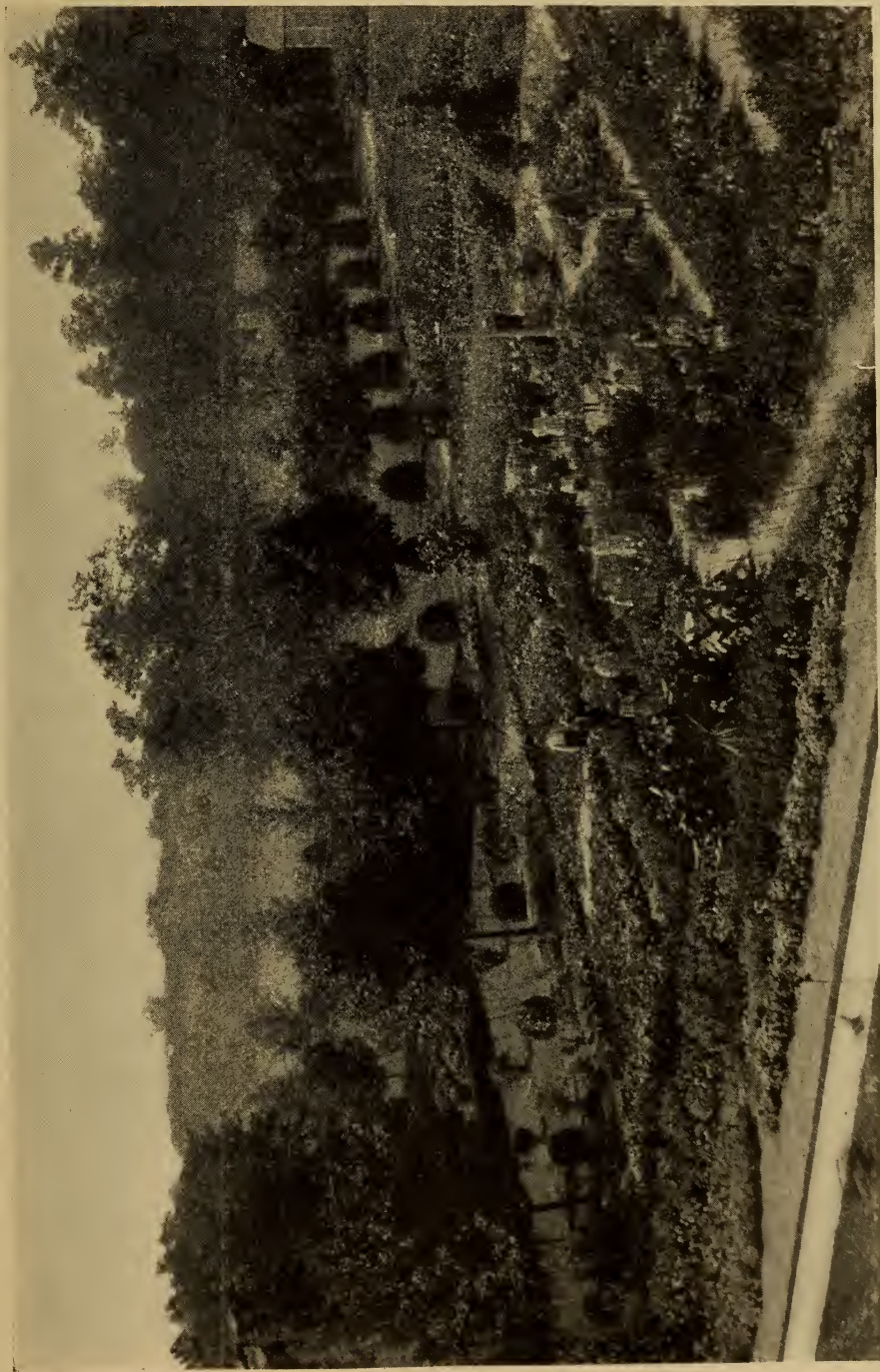


CHAPTER III

THE REAL GIRL

What Is the Ideal Home?

STRANGE as it may seem, most of the plans for industrial training, the majority of school courses of study, and probably seventy-five per cent. of the books on the crafts and arts have been devised for the use of boys. Now there are hosts of girls in this world, probably as many girls as boys, and these girls are just as keen, intelligent, ambitious and curious about things and how to make them, as are boys. In very early childhood when both boys and girls have the same interests, similar books of amusement are used by both. But as girls develop the feminine point of view and need the stimulus of suggestion and aid in creative work, the literature for them seems meagre; they have somehow been passed by save for a manual now and then on cooking or sewing, left as a sop to their questioning and eagerness. This state of affairs



A School Garden in Jordan Harbor, Ontario, Canada. Any Child Who has had this Experience, Who Has Produced or Helped Nature to Produce such Wonderful Things, will be Richer in Sympathy for Fine Things



Domestic Science Class. These Girls not only Cook but Learn about Foods, Housekeeping, Entertaining,
and Themselves Keep Open House at the School Occasionally

is more than unfortunate, it is fundamentally wrong for two very good reasons. (1) The girl up to the age of twelve or thirteen has practically the same interests, pleasures and play instincts as the boy. She is perhaps not so keenly alive to the charm of mechanical things as the boy, but like all children regardless of sex, she seeks to be a producer. She is just as much absorbed in pets and growing things, in nature, in the current activities of her environment, and requires the same easy outlet for her play instincts as the boy. (2) The girl, when a woman grown, becomes the creator of the home, and too often enters upon her domestic career with a minimum of skill or taste in the great body of household arts, which in the aggregate, give us the material comforts and homely pleasures. Moreover, since she, as a girl, probably did not have the chance to satisfy her play desires and consequently never learned to *do things* herself, she is at a loss to understand the never ceasing, tumultuous demands of her own children for the opportunity to experiment. To quote Gerald Lee in the "Lost Art of Reading," which is one of the real modern books: "The experience of being robbed of a story we are about to read, by the good friend who cannot help telling how it comes out, is an occasional experience in the lives of

older people, but it sums up the main sensation of life in the career of a child. The whole existence of a boy may be said to be a daily — almost hourly — struggle to escape being told things . . . it is doubtful if there has ever been a boy as yet worth mentioning, who did not wish we would stand a little more to one side — let him have it out with things. There has never been a live boy who would not throw a store-plaything away in two or three hours for a comparatively imperfect plaything he had made himself. . . .”

When one goes deep enough — below the showy veneer of present-day living — one comes to agree with Mr. Lee. The normal child, especially the boy, is potentially a creator, a designer, discoverer, and we have committed the everlasting sin of showing him short cuts, smoothing away difficulties, saying “press here.” No child can survive the treatment.

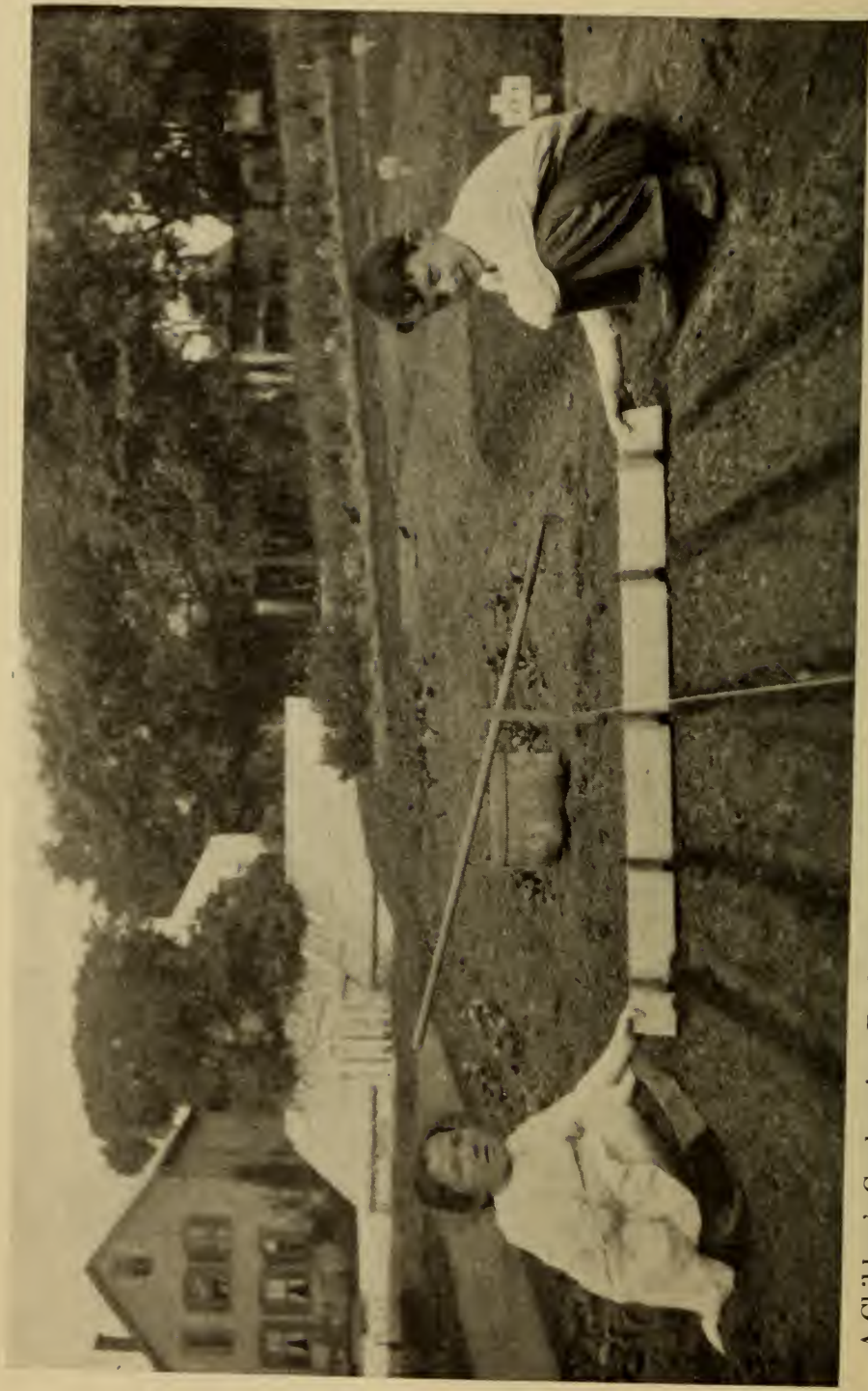
Father and mother have the very simple obligation to furnish the place, raw material (books, tools, etc.), and encouragement.

For these reasons, if for no other, the girl ought to have a permanent outlet for her native ingenuity and constructive skill in such crafts and occupations as are adapted to her strength, future responsibilities and possible interests. A home should comprise



Copyright, 1909, by Cheshire L. Boone

The Work of Girls in the Public Schools, Montclair, N. J. These Girls are only Eleven
Years of Age



A Children's Garden gives Fresh Air and Sunshine, and Best of All, Brings Nature very Near. To Be Really
Happy One Must Make Nature's Acquaintance

other elements than food and clothes, which are bare necessities; and though these may be expanded and multiplied, becoming in their preparation real art products, they alone are deficient in interest. Look over any well-ordered household, note the multiplicity of things it contains which are primarily woman's possessions, and collecting all one knows about them, the amount of real knowledge is surprisingly small. How much does the embryo housekeeper know about textiles, curtains, carpets, hangings, linens, brass, china, furniture? Where do all these charming things come from? Many of the hangings, table linen, embroidery, etc., are home products. They cannot be bought at all. The simple stenciled curtain which one likes so much draws attention by virtue of its personal quality. To have such things in any abundance the girl must create them, and this she is more than willing to do.

How may one explain the restful atmosphere of certain homes visited? How many housewives have intelligent insight concerning home management and administration; of simple domestic chemistry or sanitation? Yet these are vital elements in the domestic machine. One never mistakes a proper household, orderly, smooth running for the showy establishment — gay outside and sad inside. Even

the most untutored child unconsciously responds to the healthy influence of selected material environment and conditions, when these are combined harmoniously. There are systematic ways of creating pleasant rooms, fine grounds, comfortable places for living, places imbued with the spirit of contentment. The people who produce such places are seldom the professional decorator, landscape architect, and hired housekeeper. It is the woman of the family, who, having practised some of the arts, or at least been their disciple, has learned to appreciate order and love beauty. Therewith comes an almost instinctive knowledge of how to use them to advantage. One can never really have beautiful baskets, pottery, sewing, gardens, until one has made them. One surely cannot appreciate the true worth of clean linen, a spotless house, and perfect routine anywhere so thoroughly as in one's own house. It naturally follows that the girl, like the boy, should be a producer, not a mere purchaser, of personal or domestic commodities. She may have unlimited means, but the place where she lives as a girl and the home she seeks to create in adult life will always be impersonal, detached, *hotel-like*, unless she personally builds it. She must know the structure, composition, and functions of inanimate



All Children Love to Play at Being "Grown Up," even Beyond the Time of Childhood. These Girls will make Real Women, because They are Normal and Happy



Girls must sometime Learn of the Conventions and Customs of Domestic Arrangement, and too often
Their Only Opportunity Lies in such Classes as These

things; this knowledge comes easiest and persists longer through use and experience.

There is a good bit of psychology behind the suggestions offered, and the reasoning is simple. All our ideas, our plans, and conceptions are just ideas and nothing more until they have been worked up into concrete form — put to test. There is nothing tangible about an *idea*. But living is real; hence all the details which comprise living are real too and mere thinking about them without action is futile. One must execute, arrange, and experiment with the raw materials of everyday use. The result is either pleasant or otherwise; if otherwise, the effort has somehow failed, and one should do it again and learn thereby; if pleasant, one is the richer and happier for a bit of success, and is warmed by the presence of mere accomplishment.

This last phrase reveals the nub of the whole question — accomplishment. Material surroundings and comforts of course go far to make one happy, and they are the evidence of success, but the ideal home is also composed of people each of whom is or should be a contributor to the work of the world. The ideal home contains no drones, and therefore no discontent. Now the girl cannot plunge headfirst into the maelstrom of domestic management. She

must learn her strength and acquire confidence, and there are simple occupations for early years, occupations which train the muscles, sharpen the wits; occupations which through suggestion gradually lead to a wider and wider intellectual horizon, and which, by a cumulation of information and experience, mature both judgment and taste. These occupations form, as it were, some chapters in the unwritten grammar of culture and efficiency whereby the girl grows in self-reliance and maturity.

There are, for instance, a number of crafts which, in their delicacy of technique and the artistic worth of the finished product, are splendid occupations for girls, and some few of which every girl should know. The girl who cannot sew is an object for sympathy; it is the typical feminine craft for the reason heretofore named — that one cannot know how things should be unless one is familiar with the process involved. Gowns are manufactured of pieces of cloth cut in proper shape and sewn together in some, to the male, occult fashion, and this complex operation only explains itself even to a woman by going through the experience. One has always been accustomed to think that the accomplished mistress is also an expert needle-woman or skilled worker in textiles of some kind. Products of the

needle and loom have always been her intimate, personal possessions, and the charm of old hangings, lace, needlecraft of all kinds, rests in the main on this personal quality. Without a doubt the most precious belongings of the young girl are her own room with its contents of decorations and furnishing, and the garments which emphasize her inherent feminine charm. It is not only a girl's right, but her duty, to maintain her place as the embodiment of all that is fresh, cleanly and attractive. To this end clothes and the various other products of the needle contribute not a little; a clean-cut, thorough experience in manufacturing things for herself is the best assurance of future taste, which will spread out and envelop everything she touches. It is much the same with clothes and furnishings as with other matters, what one makes is one's own, characteristic, appropriate, adequate, with the touch of enjoyment in it; the purchased article is devoid of sentiment, it is a makeshift and substitute.

Then by all means let the girl learn to sew, learn to do for herself, to study her own needs and desires, to find as she progresses, ways to master the details of woman's own craft, and it is hoped, lay up a store of just the sort of experience which will enable her to supervise the work of others in her behalf when

the time comes. But sewing, valuable as it is in connection with the young girl's problems, is not the only craft at hand. In recent years craftworkers have revived a number of old methods of using or preparing textiles for decorative purposes, and some of these have proven increasingly worth while in the household. Stenciling, block-printing, dyeing, decorative darning, and even weaving itself, since they have been remodeled and brought out in simple form, offer opportunities to the wideawake girl. The results in each case may be very beautiful, and perhaps more in harmony with the individual taste and scheme of living of the particular girl than any materials she could buy, because they may be designed and executed for a specific place. Few people, least of all a child, work just to be busy; there is always a motive. With the girl it is a scarf, a belt, collar, curtain, or sofa pillow; is it not well worth while if she can make these for herself or her room, in her chosen design motif, (as rose, bird, tree, etc.) and color? It may be an ordinary design, peculiar color, but they satisfy a personal sentiment which, by the way, can be modified and improved as time goes on. One must needs allow children to begin with the bizarre, distorted, seemingly unreasonable, archaic desires they have and cross-fertilize these

with better ones in the hope of producing a fine, wholesome, sturdy attitude of mind.

Among the minor crafts which may be a source of real pleasure and good taste, two are prominent: pottery and basketry. The technique, decorative possibilities, and functions of the finished products as elements in household economy and ornament place these crafts high in the list of those especially suitable for girls, though boys and adults do find them equally interesting. Pottery is so closely associated with flowers and growing things, with the decoration of fine rooms, with choice spots of color, and with those receptacles and utensils which belong to the household, that it makes a strong appeal to the feminine mind. Here is a craft which vies with textiles in age and beauty of design, and possesses even greater charm of manipulation because it is plastic. One can imagine no finer outlet for creative effort.

Lastly, there is the eternal, magnificent, womanly craft — home-making. When one stops to think that the home is the one imperishable, absolute social unit, the power which creates it must take rank with other vital forces of constructive economics. Mothers' clubs and women's organizations of divers kinds, or, rather, the individuals who comprise such societies, are continually drifting into

the discussion of the worries, difficulties, and trials which attend the household. The instant household routine becomes awkward or inadequate it affects adversely each individual member of the family, and naturally the mistress who is responsible shoulders a burden. There are times when the maid leaves, or the cooking goes wrong, or the house is cold, or just a time when one gets started for the day badly. There are times when the innate perversity of humans and material things runs riot. One is led to believe that such untoward occasions, since they have been in the past, will in all likelihood continue to crop up to the end of time, though one cannot find any good reason why they should. There are homes unacquainted with any household rumble or squeak, where the domestic machinery is always in order, and flexible enough to care for sudden overloading, or absorb any reasonable shock. In many such places, devoid of servants and confined to a modest income, the mistress is ever an expert; the chances are that her daughters will be equally resourceful. Really, the only sure way to bring up an adequate number of fine, competent, resourceful wives and home-makers is to train them definitely for the profession. The girls must be made acquainted with every detail of the business which

they will surely inherit. The people who would live in hotels and frankly abandon home-making themselves merely emphasize the charm of the household, because hotels have nothing in common with homes.

It seems rather strange that a business so old as housekeeping does not, and never has, applied to its development the laws of commercial enterprise. When the community or corporation state sees the need for workmen, foremen or directors, it tries to educate individuals for the purpose. The supply of competent men and women is not left to chance. Whereas, womankind trusts to a very fickle fortune, that every girl will somehow learn to steer the domestic craft and be conversant with methods of preserving family ideals. Contrast the far-sighted plans of business to fill its ranks with the casual training the average girl undergoes to fit her for the future. What is her chance of success? Is it reasonable to suppose that one who has never made a home, or even helped actively to run one made for her, can on demand "make good?" It is a lasting tribute to the inherent genius and indefatigable patience of the modern woman that she has achieved so much with a minimum of experience.

Hence, in order to properly equip one's children for a practically inevitable future, let the girls into

the secret of domestic planning; let them know of costs and shopping, income and expenditure; of materials and uses; the care of possessions, repairs and cleaning; try to show them that the menu is not a haphazard combination of ingredients and foods, but a conscious selection of viands which will entice the appetite, furnish proper nutrition and accord with the season. By all means emphasize the fact that housekeeping, like any business, can be systematized so that the hundred and one activities may succeed one another in orderly procession through the weeks and months. Wash day and housecleaning should be absorbed into the domestic program, and never present their grisly features to the homecoming male, with sufficient trouble of his own.

Recent issues of the magazines have contained much discussion of the household tangle, and most of them have ended with the slogans "industrial education," "back to the kitchen," and such. Granted that girls need this training, and that schools in time will give it; granted that the social position of the servant is a source of discussion and friction; that the demands of modern living are exacting; and, finally, granting the insistent prominence of all the other economic disturbances, who is, in the last analysis, to blame? Would a business man

think for one moment of handing over any department of his affairs to one not trained for the particular duties involved? Industry in every branch seeks men and women *fitted* to take charge of even minor matters. And when trained assistants are scarce the obvious policy is to prepare other promising workers for such special places. On the other hand, mothers too often prepare their daughters for marriage, not for home-making, seemingly blind to the fact that marriage is an inert, barren, static condition, save in the stimulating atmosphere of a fine home. How can the servant question ever be settled by untutored girls who get no closer to the domestic question than fudge, welsh rarebit and salted peanuts? The *school can and does* now, in all well-ordered communities, give a very satisfactory formal, technical training in domestic art and science.* There students learn to cook and sew; they learn a good deal about food values, dietetics and simple food chemistry, simple sanitation, etc. But the management of a real house, system and everyday routine, that fine sense of adjustment to the conditions as they exist — these essentials can only be learned in the home itself. The efforts of the school can

* As the High Schools of Springfield, Newton, and Brookline, Mass; Cleveland, Ohio; Los Angeles Cal., among others. And the elementary schools of practically every well-organized community.

largely supplement but never replace home guidance, experience and *responsibility*. Keeping house ought to be a science and art rather than a game of chance.

Definite Suggestions

In the "Library of Work and Play," to which the present book is the introductory volume, one will find a collection of books replete with suggestion. But these are not manuals, or courses to be followed from end to end, because children do not *profit most* by such a plan. The child is like a pebble dropped into still water. It communicates its energy of momentum to the surrounding fluid and makes a circular ripple, which in turn makes another and wider ripple, until the energy is exhausted. In much the same way the child, landed in the midst of a more or less inert material world, acts upon it with energy, *which, however, is never exhausted*, producing the results which become more and more extended. He begins in the middle of a given subject and works in all possible directions, which gives one the clue to how to make the most of books like these.*

If the girl has not already indicated a decided preference for some recreation or play, place at hand the books which show the possibilities open to her.

* "Library of Work and Play."

It would be well for one to go over them rather carefully first in order to know what they contain. Let the girl take her leisure in searching the chapters and illustrations for the suggestion which strikes a responsive chord. Ofttimes it will be quite in order to point to chapters which have a bearing on some personal need or desire. At any rate, the book or chapters which seem to be most significant at the time should be followed up. Read over with her such a volume as "Home Decoration" or "Housekeeping." Let her discuss the plans offered and try them out in her own home. Every girl wants and should have a dainty, inspiring, beautiful room of her own, and as she grows older she also wants the rest of the house to match, so that she can entertain her friends with pride and confidence. If one will take "Housekeeping," "Home Decoration," and "Needlecraft" as texts, and select from them first those suggestions which are *immediately apt* in a particular home, the girl will shortly find herself looking at home problems from several different and very important angles. But it is desirable also that the study be taken up first in a very simple way, in order to tie it to real living and needs. New curtains, pillows for the porch or den, stenciled scarf, the decorations and menu for a

small party, additional linen: these are some of the problems always coming up, which may be used as a beginning. And once the start is made the girl should have the chance to try other experiments along the same line. Read with her the chapter on menus and marketing, or housecleaning, and turn the house over to the daughter for a time to manage — absolutely. There is nothing in the world which children love more or which develops them more quickly than responsibility, and the mutual consideration of household affairs gives the girl real partnership in the domestic business. She may use the "Housekeeping" book as a kind of reference, to be sought when new problems in management fall to her share.

The question of home decoration is so vital that it deserves special statement. The text* deals with all those details of interior furnishing and embellishment which indicate taste. All of these are not equally important, nor do they interest all girls to the same extent, and in using the book one can profit most by the study of those topics which touch the individual or particular family. But everywhere there is the problem of furniture arrangement, wall decorations, color schemes, and the skilful

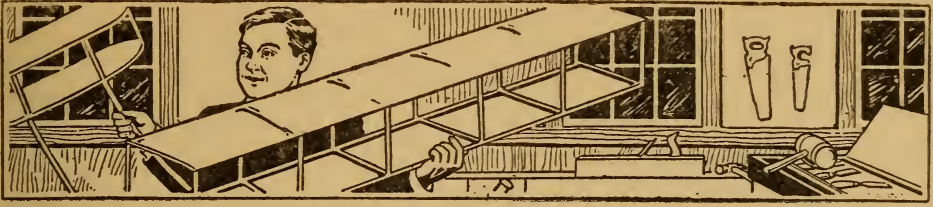
* "Home Decoration."

use of flowers, pottery and textiles. Give the young people, and especially the girls, an insight into how the interior should be treated. Have them look up pertinent questions in the text and then try their 'prentice hands at creating a pleasant, restful, homelike house with the furnishings at hand plus whatever they can make or secure. Really, the book is as much a volume of suggestion for the mother, to which she can refer her daughter, as a text for the child. There is very keen interest in taste in recent years, among young people as well as parents, and the elements hitherto lacking have been (1) accessible information and (2) opportunity to "try it out." Offer that opportunity; a flat is just as fruitful a field for experiment as a house, perhaps more.

The active participation in outdoor life, nature-study propaganda and the multiplication of popular scientific (nature) literature has greatly opened another field to children — that of raising pets, gardening, etc. Here the boy or girl will readily make some choice at an early day, if there has been any contact with such things. If not, a volume of this kind* will be a real stimulant and inspiration, as it should be, not a lesson manual. Place the

* "Outdoor Life."

book in a child's hands, help him look over the conditions, available ground, cost, care, etc.; let him send for circulars and catalogues, or if possible visit some one interested in the same hobby and the experiment is under way with irresistible momentum. It is a godsend to any child to give him a simple, direct statement of what can be done; he furnishes the steam and imagination for future development, and father and mother comprise the balance wheel of the business. This volume and the one on "Outdoor Sports" contain a mass of information which touch the interests of practically all boys and girls at some time in their first sixteen years. When the child is old enough to launch out in any personal undertaking, old enough for even minor responsibilities, when he or she expresses the desire for possession and money, then give them books like these. Let them soak in and digest. Encourage only those requests which are convincing, but give them all the scope possible. Every child will eventually select the pastimes which are best for her though she may stumble in doing so; she will make fewer mistakes, and waste less time if she have access to books which will crystallize and guide her ambitions.



CHAPTER IV

THAT BOY

"The prime spur to all industry (effort) was and is to own and use the finished product." — HALL.

ONE day the pedagogue, who was a learned man and addicted to study, shut himself up in his library, bent on devising a method for training boys into men. This master was well versed in the sciences so that he could follow the stars in their courses, make the metals and substances of the earth obey his will, and guide the plants in their growth from seed to blossom. Nor was this scholar lacking in sympathy for the arts, if they were not too fine, for his desires all led to systems and orderly arrangements of matter, and those subjects which would not succumb to analysis he looked upon coldly.

Hence in this problem of education he made a careful survey of the history and development of learning from the beginning — seeking those ideals

and standards of culture which had been approved for the *scholar*, because scholars have always been held in high esteem by those patrons who, being ignorant themselves, wanted scholarship nearby. It was found in the course of his delving that the sciences had originated and developed in about this order, mathematics, astronomy, geology, botany, biology, etc. The arts of expression had of course developed as a group, but chiefly through literature from the beginning. There seemed to be a good deal of recent interest in machines and engineering, and of course certain classes had always tilled the soil, because one must have food; but the study of these activities could not lead to culture, because culture had always had to do with thinking, not [manual labor. Therefore it became clear to the master that up to the present time, since the end of all scholarly ambition had been a profession (law, medicine, theology, etc.), education must be a very simple matter. All one had to do was to prepare certain capsules of mathematics, grammar, Greek and Latin, and a few, very few, odd pellets of science, etc., and at stated intervals stimulate the boy's mental organism with the various toxins in rotation. Were these subjects not the very basis of culture, and what would be more logical than



A Boy's Camp with Ernest Thompson Seton. There Was Never a Boy Who Did Not "Make-Believe," and Here the Play Spirit, under Stimulating Guidance, Becomes a Powerful Factor in Developing the Appreciation of Community Effort



The Play Idea very soon Grows Toward the Representation of Primitive though Adult Customs and Actions, in which Several Join a Common Body or Company. Hence City Gangs which Merely Seek Romantic Expression

direct systematic presentation of the fundamental principles? If the patient did not respond nothing could be done but to use more medicine, more lessons; there could be but one line of treatment. With this question settled the good savant signified his readiness to instruct youth in such branches as were desirable for the educated man, and pupils came in numbers to obtain the precious learning, for the pedagogue was favorably known as a great scholar. But these pupils who came, like the master, happened to live in or about the year 1912, when the chief interests of the people were business, science, and engineering; when transportation and communication had become highly developed and systematized; when farming and agriculture were almost arts, the whole welfare of the nation rested on industry, and utility held high rank as an element in culture among the people who worked. Even when a boy of this period did not seek industrial honors and follow in the footsteps of his father, he must needs be interested as a citizen in so important a source of prosperity. Hence the children who set out to become pupils of the learned teacher were alive to the business and activities of their time and surroundings, and were more than willing to learn when the learning led to a useful end. But

the scheme proposed by their mentor was such a queer scheme. Of course it was better to go to school than do nothing and one must study a few things, but how much more fascinating and worth while to talk about birds and animals, trolley cars, the railway, electricity, machines, and doing things with a purpose, than to discuss impossible stories written by people who evidently knew very, very little about young people, to learn unending pages of numbers and definitions and facts, which, since one had no use for them, were speedily forgotten to make room for better material?

Now these children were obedient and reverent toward learning and did the tasks assigned them by their master, but in their leisure hours they did a good bit of experimenting along other lines, and found several other studies which were not in the master's scheme much more to their taste. Animals and pets were not only nice, live, soft, downy, fuzzy things to play with, but they had such queer ways and were so useful that one could talk about them forever. And then if one raised numbers of them, often neighbors would desire to purchase, and behold, a business began whereby it was just possible one could make a profit now and then. Again, it was fine if one had even a few tools so that one could put



A Typical Boy's Workroom and Shop. Pride of Personal Possession Develops rather Early and the Boy Should Have a Place of His Own



The Kind of Shop which One May Have at Home

together the toys and playthings *necessary* to everyday amusement. Of course it was needful to measure and calculate and scheme about materials and costs, but all this scheming led to real purpose, while the questions proposed by the teacher were just questions after all and it couldn't make much difference whether one found the answer or not.

Now the usual thing happened. Because of their reverence for traditional learning and respect for its apostle the youths continued to attend upon the master and go through the ceremonial form of intellectual purification. But really their hearts were outside, wrapped up in the work of the world, where they had found just the tonics which were good for them."

In just so far as the school and home open ways which "enable the student to earn a livelihood and to make life worth living" do we see the passing of the old type school (suggested above) and ideal of training. Not only are there comparatively few in this world capable of receiving high polish through the so-called culture studies, but the definition of culture has changed; now *any activity is cultural which arouses one's best efforts*. Moreover, the boy of the present is on the lookout for a

new type of instructor, one born of the new era of industrial success, a teacher who will unlock the mysteries of modern nature, science, engineering and business, and who will make it possible for the student to find his special abilities or bent at an early age. It is no argument at all to say that the boy is too young to know what is best for him, that the mature mind is the only safe guide. The adult teacher and parent becomes a true guide only when he uses as a basis for guidance those qualities and instincts of childhood which cannot be smothered or eradicated. The child, whether boy or girl, knows instinctively some of the kinds of information which do not agree with him, because they possess no significance at the time and he cannot assimilate and fatten on them. The child needs a new and more nutritious mental diet. Father and mother cannot be of great *direct* assistance because, strange to say, they are not experts with *children*, they merely know *a child* (their own) passably well, but they can provide a most effective, indirect, contributory stimulus through outside opportunities for healthy play and experiment which will supplement the formal instruction of the school. And children of all ages up to the time they go to college need some strong outside interest, or group of them,



The Kite Fever is an Annual Disease, Common to practically the Whole Country. But it is a Disease which Flourishes only among Normal Children, chiefly Boys



Pump and Waterwheel. A Type of Mechanical Problem which the Boy May Begin With, Both In and Out of School, because It Touches His Keenest Interest

which will serve as a finder to determine the trade, profession, or business of the future man.

The children who enter the school, from whatever grade of society or given race, are all much alike — lively little animals that sleep, eat and talk continuously, and play, though play and expression are one and the same. They do what all animals do — keep on the move, acquire muscular skill and precision, and endeavor by every possible means to express their ideas and convey them to others. This expression takes on a constructive phase when children play at store, keeping house, fire engine, and make toys of paper and cardboard, and such amusement is the forerunner of that intense mechanical interest which overtakes boys about the age of ten or eleven.* Girls have an equally positive leaning which is characteristic and will be noted elsewhere. Watch any group of boys of average parentage and surroundings and make a list of the things they construct for themselves, for their own ends. In any such list extending over a period of several months will be found, according to locality, such things as wagons, sleds, whistles, kites, dog houses, pigeon roosts, chicken coops,

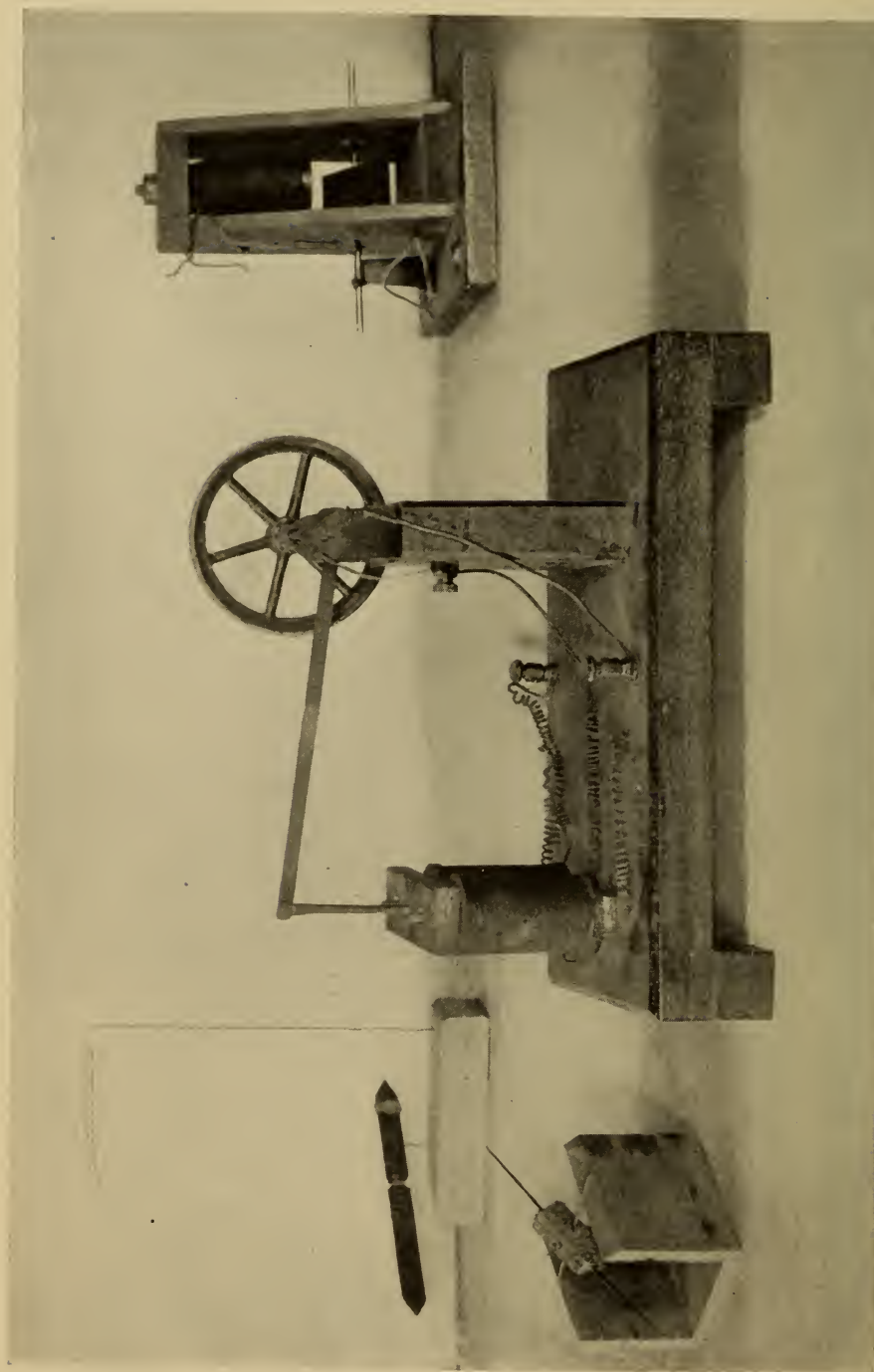
* This bias toward mechanics has already been noted by teachers and parents, but in recent years has assumed unusual significance because of the extraordinary development of industry. This, combined with the researches of modern psychology and pedagogy, has introduced a new, a powerful motive into teaching.

boats, guns, etc., etc. The young artisan uses whatever raw material he can; he is chiefly concerned with the plan, and makes the best of conditions and materials. The things he makes are always for real use, a principle held in high esteem in all the arts. In making these toys the boy acquires some exceedingly valuable information and a physical skill and perfection which can only be secured at an early age. He learns about things, about raw material, about tools and utensils common to every household; he gets on speaking terms with the fundamental laws of mechanics and, more than one would imagine, develops a real ingenuity in molding material to his immediate needs. The construction of a bird house or kite is in itself simple enough, but the boy has to spend considerable effort in finding out how to do it, which is beneficial. Moreover, this constant struggle to get into tune with his physical environment and subdue it results in a considerable independence, confidence, and resourcefulness, which under moderately favorable conditions will produce a boy alert to the world in which he lives and full of the spirit of investigation — the critical attitude. Such a boy will not lean on others for either learning or pleasure.

Actually, however, the modern boy has not been



Boat Made by Percy Wilson and Donald Mather, Montclair, N. J., Independent of Adult Assistance. The Method of Construction, which is Unique and Sound, was Devised by the Boys



These are the Forerunners of Numerous Other Electrical Constructions, Many of Which are Produced Out of
School, in the Home Workrooms and Shops

Copyright, 1910, by Cheshire L. Boone

encouraged along these lines, nor has he been taken very seriously in those activities which affect him most; hence his struggle toward any real efficiency. A prominent man once said:

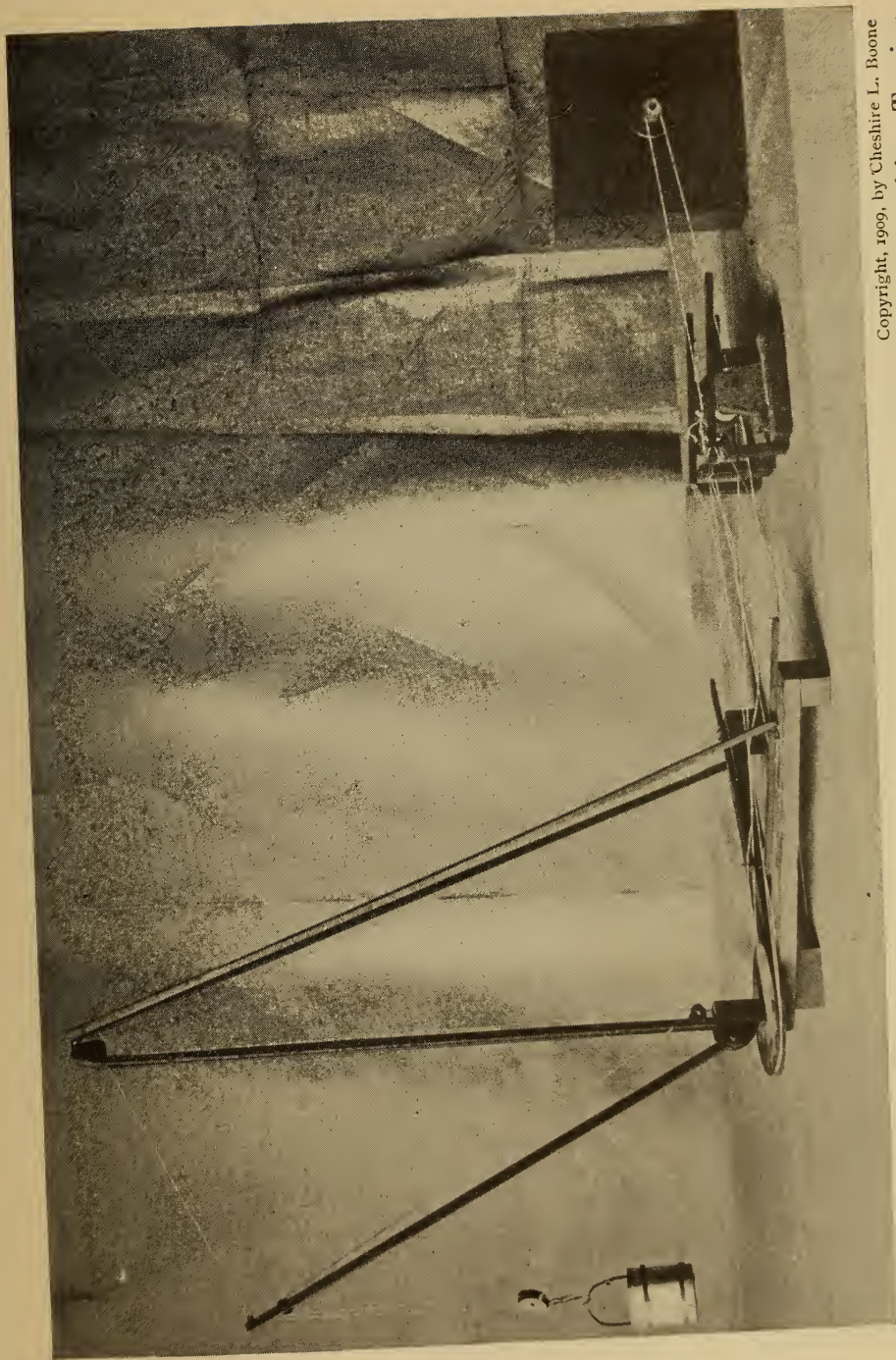
“When I was fifteen years of age I could break wild horses to saddle or harness, and teach kicking cows to stand while they were being milked. I could fell trees and drop the tree in any direction desired. I knew the relative value of all native woods, appreciated the differences in soil, grains, fruits, and simple minerals. I could use the draw-shove, adze axe, broad axe, cross-cut saw, sickle and cradle. I could make a figure-four trap, an axe helve, a neck yoke, axe yoke, whiffletree, clevis, and could braid an eight-strand cattle whip. We used to mend our harness on rainy days and I could make a wax-end and thread it with a bristle, and use a brad-awl. I knew how to construct an ash-leach and to make soft-soap, apple butter, and pumpkin pies. I knew the process of weaving flax and wool, of making and burning brick. I knew on sight and had names for a score or more of birds, and had a good idea of the habits of squirrels, skunks, wolves, and the fishes that swam in the creeks. I knew how to cure hams, shoulders, and side-meat: to pickle beef and cover apples with straw and earth so that they would keep in safety through the most severe winter, and open up in the spring fresh and valuable. Of course my knowledge was not of a scientific order, and I could not have explained it to another, because I never knew I had it.”

How many boys or girls of the present time possess anything like this sum of *useful knowledge* — useful for the conditions in which they live? There

was a time when children had to learn in order to survive, and now that the necessity is removed and children are simply allowed to grow without purpose, the boy and girl inevitably lose one of the best elements in their training unless new opportunities are opened.

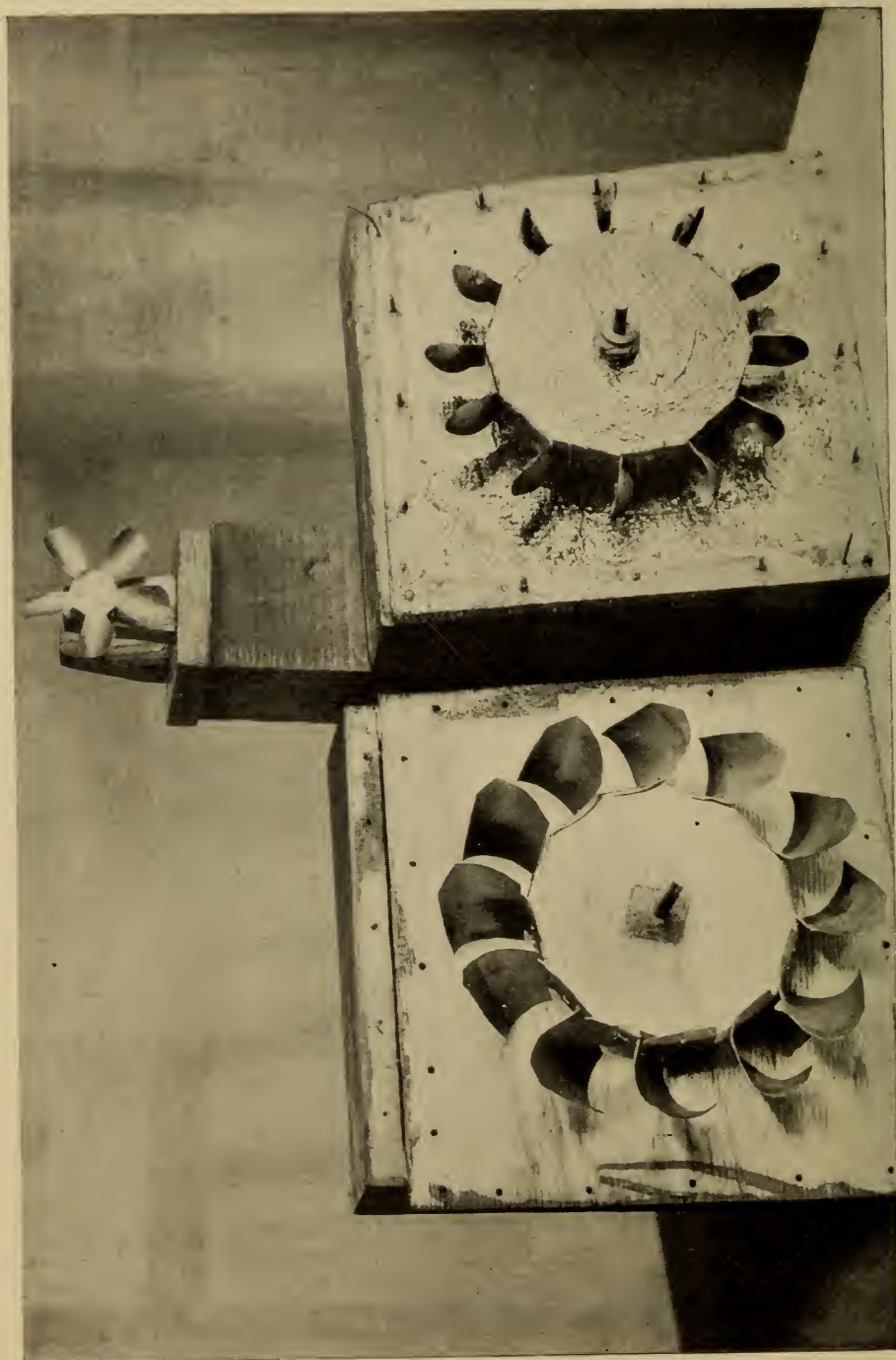
It is not difficult to see how the boy's interest in construction grows and expands; mere acquaintance with boys will furnish the data. At a comparatively early stage the youthful experiments are naturally sifted to a few specialties, which assume prominence either because of the boy's reading or the type of locality in which he lives. From time to time his interest may shift, investigating one subject after another, always seeking the unknown avocation. The process will probably lead in time to a more or less fitting selection of trade or profession. How else is the boy to find himself?

After he has passed through the preliminary stages of mere play and haphazard amusement the boy becomes conscious of the mysterious, unusual forces of electricity; they hold even adult attention and wonder, but the boy, being more impressionable and confident, immediately forages for information, reads enormously, and experiments. He takes in the whole subject with a vim and sureness that is



Copyright, 1909, by Cheshire L. Boone

A Real Derrick in Miniature, Operated by Means of a Waterwheel (at the right). The Lifting, Turning and Handling of the Bucket are Controlled by Levers Attached to Spools (in the middle section). This Sort of Thing is Part of Regular School Work

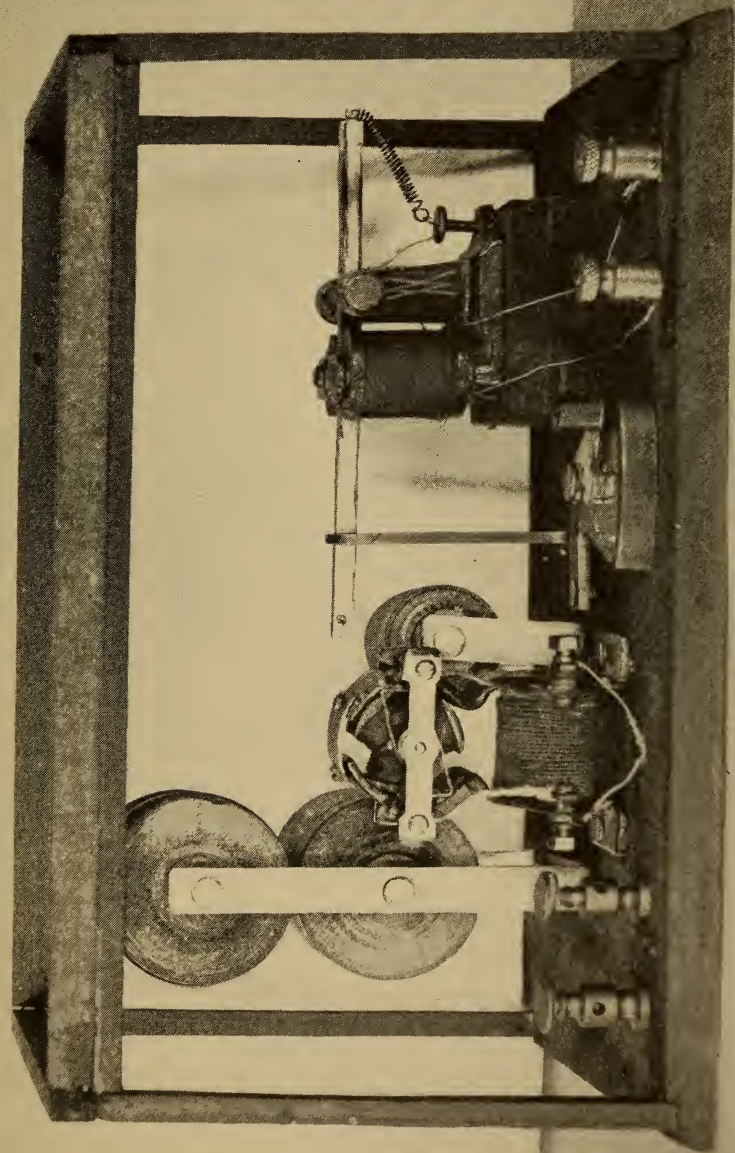


Waterwheels (lower illustrations) and Fan (upper illustration), made by Public School Pupils

de facto evidence of its intrinsic worth for study purposes. And in a much shorter time than adults would require, he has mastered the fundamental laws and is eager to put this wonderful force to work, to make things move. He has the same attitude toward steam and gas engines, water motors, and studies them with the same intensity of purpose. Here are dynamic elements which appeal to the human appreciation of *power* and which may be harnessed, subdued. The idea is comparable to the ancient reverence for fire, water and the storm. Since modern science has organized engineering and mechanical knowledge and simplified it, the student can have at his disposal just the books and periodicals needed to unlock this storeroom of mystery; these publications were written for the purpose. But there are several other openings for creative effort which appeal no less strongly, and among which both the boy and girl may choose, with complete confidence that there will be ample room for initiative, ingenuity, and utilitarian bias.

Every child loves to go camping, and in common with his elders reveals the close connection with primitive life in general through the pleasure derived from the simplicity of camp life. There in the woods, where conveniences are few, every device

and construction counts the utmost, and its purpose is apparent. The whole spirit of such living is more in harmony with child nature and longings than the modern city home; it supplies the craving for physical freedom and places the boy or girl almost entirely on his own resources. What he obtains in the way of pleasure comes from his own efforts and is correspondingly precious. The boy especially finds in camp just as much chance for mechanical skill as elsewhere. Temporary furniture, utensils, cooking conveniences, the shelter, traps, etc., are suggestive. And lastly the unconventional, untrammelled outdoor life stands in that same relation to the boy as it did to the savage (because boyhood is a primitive stage); he puts forth his strongest endeavors to conquer the elements, the climate, the earth, and growing things; to provide himself with food and shelter — in other words, to survive as the savage sought to survive. The idea is truly epic. No wonder the child expands and develops under the simple responsibilities imposed, and absorbs woodcraft with such astonishing ease. The recent extraordinary growth of the summer camp among boys' schools, and the results suggested in the writings of Ernest Thompson Seton, are, with the unfolding of industrial education, two pointed ex-



Copyright, 1910, by Cheshire L. Boone

A Self-recording Telegraph Receiver. An Excellent Example of what the Juvenile Mechanical Mind will Attempt. The Number of Boys Interested in such Projects is Considerable



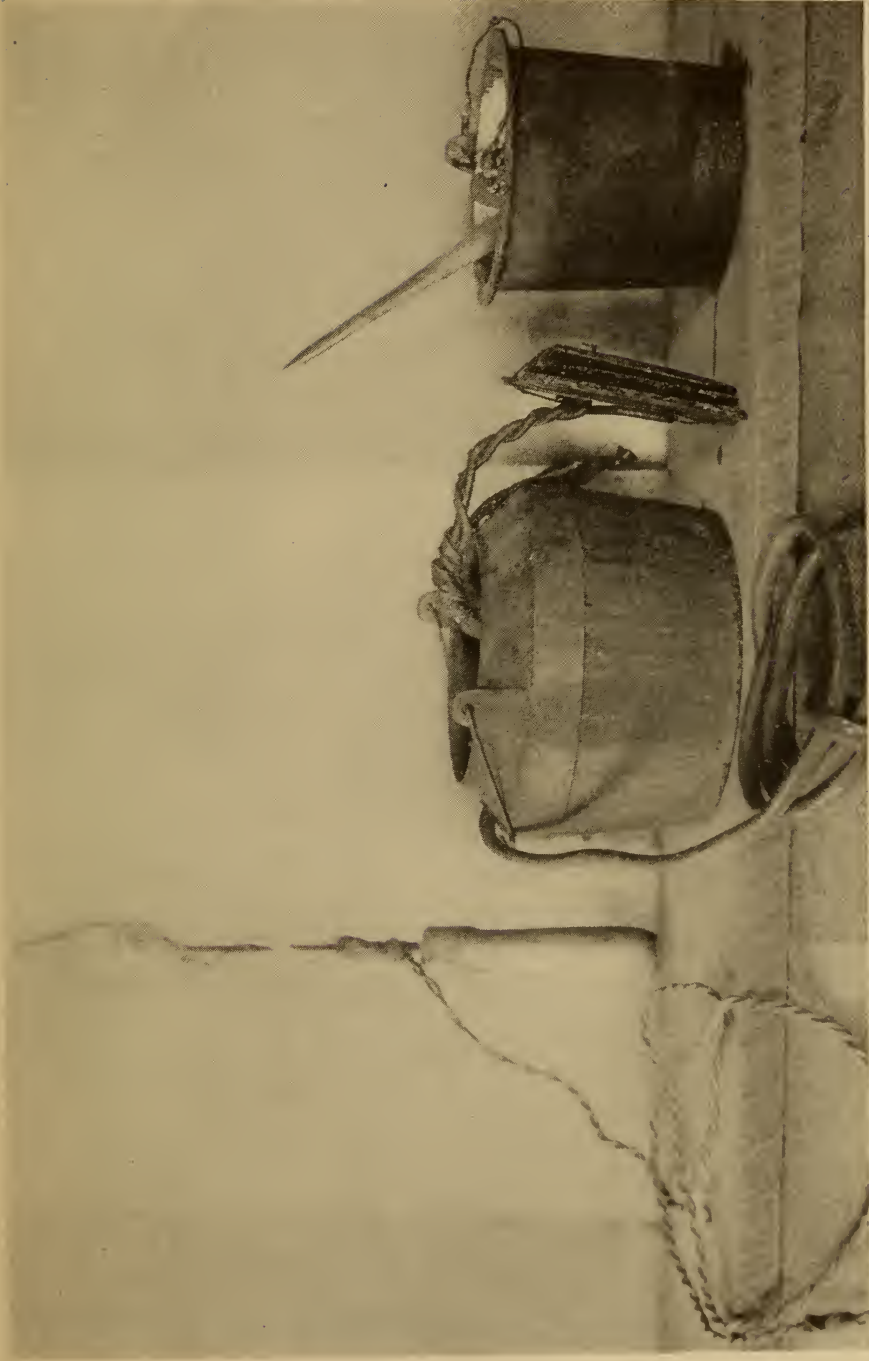
Wireless Station and Workroom of Donald Huxom, Montclair, N. J. This, too, Indicates how Boys Square
Themselves with Scientific Progress

amples of the shifting view of education in the home as well as school. Probably no outside agency will in time become so effective for good as the Boy Scouts, whose code is based on a very primitive framework suited to boys. During a recent visit to California, and while crossing the flat prairies of Kansas, the writer saw a company of scouts at work. It was borne in upon the observer that there was an organization which fitted every locality, every climate; it appealed to *boy*, not *creed*, *social order*, *time*, or *adult dogma*.

One should at least mention athletics in this connection, because of the excellent physical benefit in both activities. Athletics, however, contains an element which is all-important — team work. And no restraint is so much needed, nor so cheerfully heeded for that matter, by the restless boy and girl as a community of effort. The elimination of a purely selfish personal point of view is very difficult to bring about with the best of children, because they are wrapped up in their own affairs, and nothing serves to introduce them to the rights of others and the value of concerted action for a common good so well as sport. The kind does not matter. Any well-conducted, clean enjoyment of this kind develops that mental pliability and willingness to

take a part which is a fundamental of citizenship. Incidentally leaders arise, and the beginnings of organization dawn. It is a great day when the boy learns his first code of signals in the ball team!

There is one more side (at least) to the boy and girl business — *earning money*. It is nothing short of marvelous that this desire for personal income, however small, has not been taken seriously. Why do children want to earn money? For the best reason in the world, *independence*. Man's entire existence from the earliest age down to the twentieth century has been one long struggle toward it — toward survival. First he had to combat the elements and animals, then his fellows, for possession of food, lands, water, raw materials, and wives. When he found that possession of certain commodities added to his importance and therefore comfort and safety, and especially to his privilege, he sought wealth and its freedom. Now the boy and girl follow stages in development toward similar independence, and among the privileges most desired is that of money or possessions of value. If they earn it, the amount represents so much work and gives the coins a fixed worth which cannot be established in other fashion. Moreover, this desire for income (rather than money) is one charac-



Copyright, 1910, by Cheshire L. Boone

An Electrical Soldering Iron and Glue-pot, made at Suggestion of Instructor for Use in School Shop



Copyright, 1909, by Cheshire L. Boone

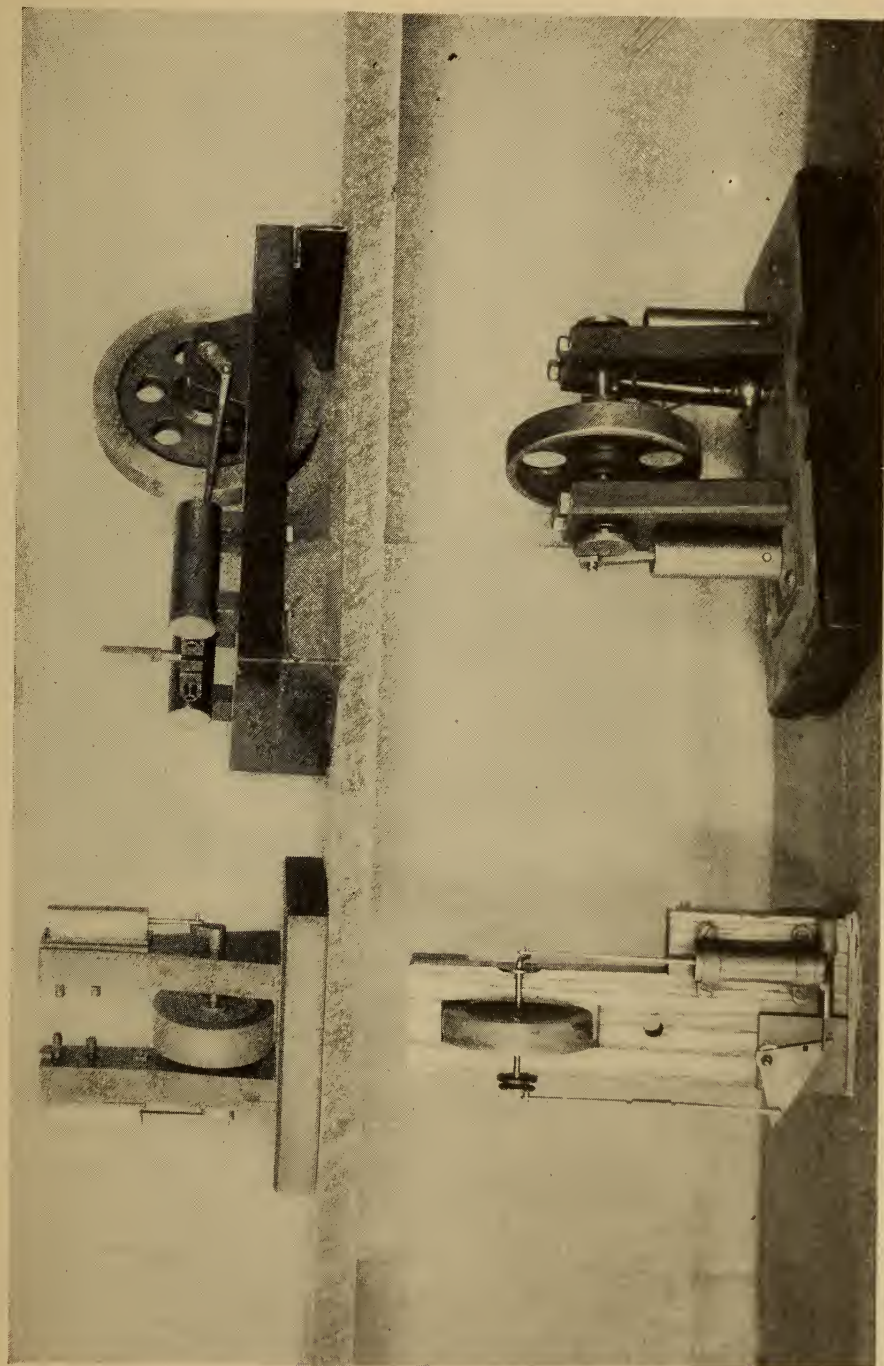
Waterwheel Connected with Model Lathe

teristic of the child between the ages of thirteen and fifteen years. His power of reasoning and organization are developing rapidly, and it is the time when adult ideals and actions first look attractive. The time is ever ripe for launching the boy or girl into any avocation which holds their fancy, that they may forget their own oblique tendencies to laziness, stubbornness, wayward action, and selfishness; these are all characteristic of the stage. Sex changes too play no inconsiderable part, because the boy's companions are for a time all masculine. Business of some kind is just what he needs, and if that business is profitable, a powerful motive is supplied. Perhaps the keenest interest is that in nature, and most children at some time have desired pets — chickens, rabbits, pigeons, dogs, song birds. There is scarcely a town or city condition where some animal hobby cannot be pursued without disturbing others' peace of mind. But it should be looked into seriously as a business, a miniature counterpart of other like enterprises. The disposal of personal service and products to others brings the child in close contact with numbers of adults and adult standards and business connections. It fosters responsibility and places upon the child the burden of proof, to show that he is entitled

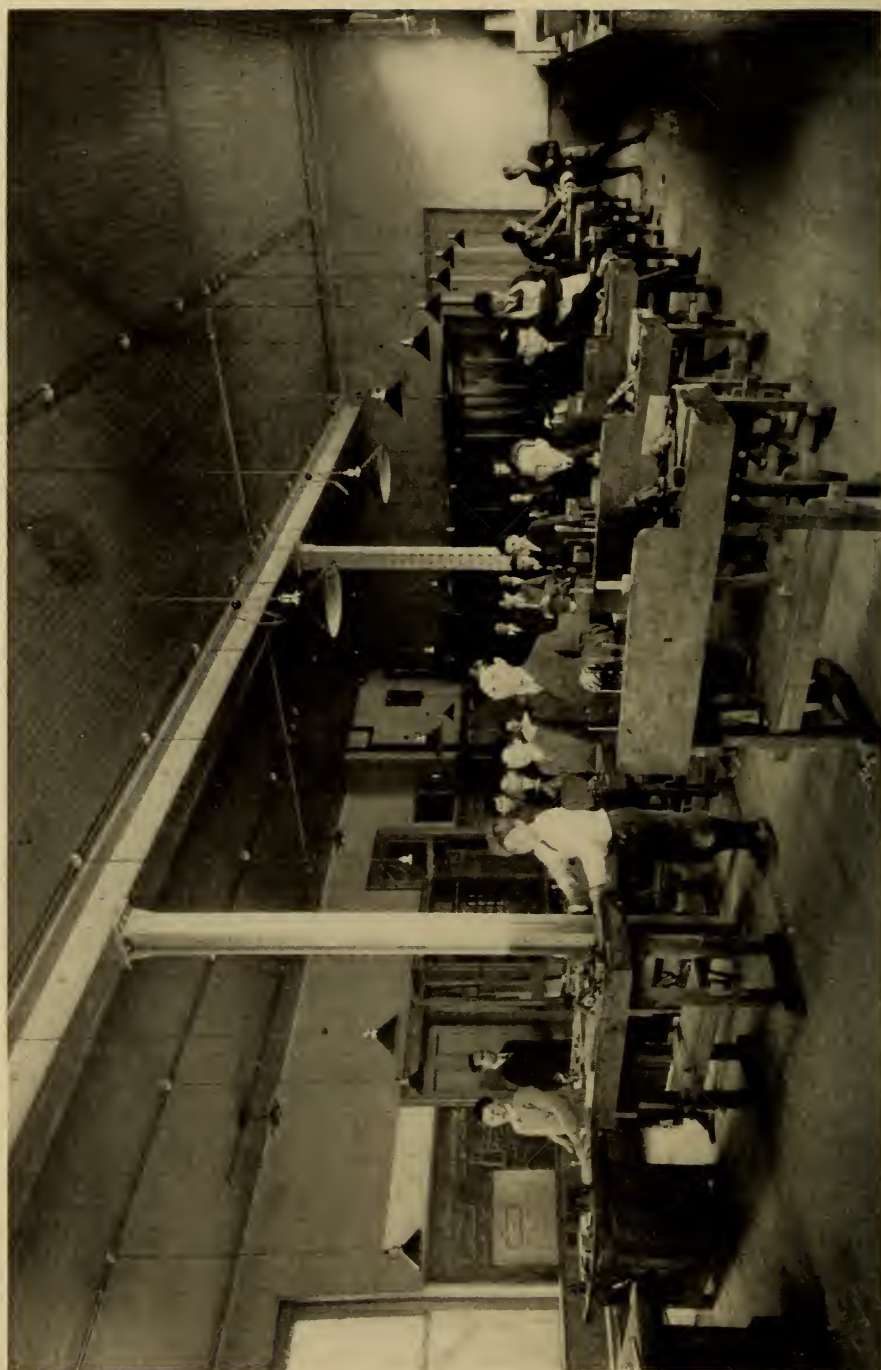
to a place as a valuable member of society. And just here it may be well to say, even if the child does not need the money he earns, it will be the most precious he will ever own, because since it came through effort, it will be spent with due caution.

The vegetable and flower garden may be made to yield similar returns and such products are always salable. In addition, every house, every yard, every farm is in constant need of repairs, changes and care which the alert boy or girl can furnish. The development of such odd tasks into a business parallels the development of every large enterprise which began in a modest way. It fosters the best of personal and civic ideals, and tames the restless, self-conscious energy of youth into smooth and profitable channels through which to journey in peace to a sane maturity.

Is it any wonder that education is so ineffective at times? In the light of present-day appreciation of physiology and psychology it is increasingly clear that education has furnished an impersonal, rather stilted system of stuffing along restricted lines for a warm-hearted, all-inquisitive, nature-loving human animal which automatically refuses to be nourished thereby, and forages elsewhere. Although the child's judgment can by no means be followed



Excellent Examples of High School Work which is Really Profitable. These Machines will Work and Develop Power which can be Measured



A Manual Training Shop

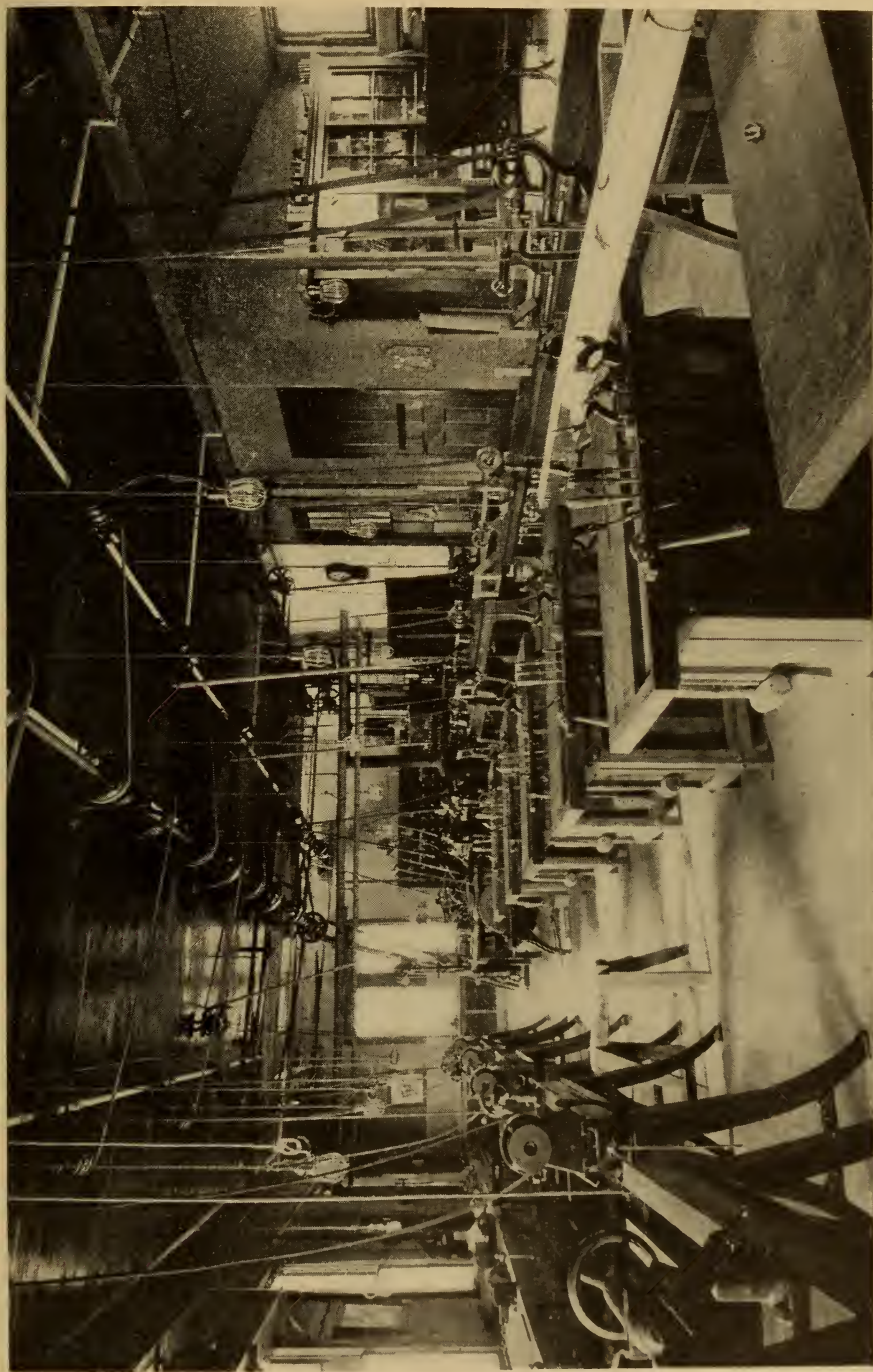
concerning what is best for him, his instincts and possible future will serve as a most excellent guide. His early training must take into account those interests which are most keen and lasting and use them as the framework for instruction, and all subsequent stages of training involve a distinct obligation to build upon this elementary foundation, with a view to social worth. Most children will have to earn a living (the girl usually helps by managing the home), and this necessity is preëminent. But whether rich or otherwise, the ideal of social worth remains for all. And the least the home can do is to nurse childhood's efforts and experiments in play and occupation which lead finally to mature judgment and conceptions.

How to Use Books with Boys

Boys probably obtain more help from books than girls do because they are more self-reliant, more assertive and impatient. And as has been indicated, more books have been written for boys, but the same general method of use is common to both. The boy too finds in the book of crafts, mechanics, science, or sport a stimulant and incentive. He reads it much as he would a story of adventure. No matter what his greatest enjoyments may be,

the perusal of accounts of others' juvenile activities widens the productive horizon in a way not to be ignored, and for this reason "How to Do" books of all kinds are a serious element in the boy's life, at a time when he is less concerned with what to do than with how to produce something. But there is a danger in this catholicity of interest: it may become dilletantism. The boy may merely potter or fuss with one hobby after another, more because he cannot supply the need for more and more information, than because he does not care. Hence it is worth while from time to time to add more fuel to the flame of ambition in a given direction, to provide books and tools, a working place or shop, and open the way for progress in some stated direction.

Specifically, books like those on "Mechanics, Indoors and Out," "Electricity," and "Carpentry," and parts of "Outdoor Work" may be considered as of one type. When he receives the books the boy will spend days in absorbing their contents, maybe dreaming a bit over the possibilities in view, and finally, by a process which will always be unintelligible to the adult, will light upon a problem or group of them that meets his wishes, as the kite for instance; all he needs from then on is human sympathy with the, to him, important under-



The Machine Shop. Public School, Montclair, N. J.



The Study of Aeroplane Construction, Public School 77, N. Y. City. This Toy is Full
of Possibilities for the Live Boy



A Successful Machine



Finished Aeroplanes. Public School 77, N. Y. City

taking, and he will gallop through all phases of the kite construction and devices, aeroplanes, propellers, forms of motive power, probably bringing up short at the steam or gasoline engine, which opens another chapter. The really important item connected with the use of such books is to keep the young mechanic on one thing at a time. A bit of judicious questioning now and then, always aimed at a group of related problems upon which he may be engaged, will keep his mind working connectedly. His efforts will then be cumulative in effect. Visits to the aero park, the museums, to the shops and technical schools, and to the local power plants are other distinct aids which should be invoked to supplement and emphasize reading and experiment. In some of the cities model kite and aeroplane contests are held at regular intervals, and these put boys on their mettle to succeed. In fact the proper way to use books of this kind is to *let the boy use them*; let him begin in the middle of the book and work outward or at the end and go backward, but see that he has books which present the subject vividly, simply. Provide him with the essential tools and materials and a place to work. About the surest way to make a success with boys is to let them have a room or corner of their own where they can work

to their hearts' content, where they can store their precious belongings, and where companions may come and talk over things. Really the book is inadequate alone. Unless one provide the opening for action, books but aggravate and excite the mind, mockingly spur the student on to "do." Hence with the book goes a tacit obligation to provide means and place, even the most modest, for putting the book to test.

There is yet another phase to this use of books, and it is one which the boy will usually meet, if the texts are adequate. It is this: whatever the young student does best will be the result of real desire, real personal enthusiasm. It is a fallacy to suppose that the boy interested in tools should always put up shelves, mend the door, or fix the fence. He will execute these tasks cheerfully, but they are not the subject of his dreams. On the other hand, if the desire be to earn money, to have a small business of his own, fences and shelves and plant stands may be the most interesting things in the world to him, because they are *means*, not *ends*. Hence the printed book is no teacher or trainer of children, no direct guide to future vocation, but is the very essence of inspiration, the foundation from which the young secures nourishment for day dreams and ambitions, out of which he patiently weaves the rich fabric of experience.



CHAPTER V

A HOUSE AND LOT — ESPECIALLY THE LOT

THE past decade has witnessed a movement, just now taking aggressive shape, which is unique — the interest in outdoors, nature study, farming, summer homes, sport, and what is termed the simple life. It is a movement filled with the greatest promise of any among the host now claiming attention, and bids fair to soothe the tired nerves and over-stimulated minds of a frantically industrial age. Busy men and women, particularly the men, who once thought their affairs would become hopelessly muddled if they were not at the desk each and every day, now indulge in sport, farming or gardening, and horticulture. They have become convinced of the benefits of fresh air and consequent health, and have a calmer, more serene outlook on life as a whole. It has become “quite proper” now to live in the “country,” even though the country is represented by a lot 40 x 100,

for one may have a garden which produces wonders even on such a lot. Indirectly, people get the desire to fix up their homesteads, to plant hedges and vines, to have window boxes and put on a kind of apologetic style which develops into conscious pride ultimately. One cannot play with such an avocation long without learning a bit more about nature in general, and without any conscious resolution drifts into keeping chickens or pets as a kind of pleasurable refuge from mundane things. All this activity is much more than a fad; it points to a recurrence of the primitive instinct to always bridge the ever-widening gaps between nature and the human, who is merely an extra-developed animal himself. Children always possess in a marked degree a love for outdoors, for animal life, for growing things, and fight hard during the early years to satisfy the desire. When they cannot achieve results at home, the surplus energy is worked off by harrowing the neighbors. Steam will do a great deal of work when under control, but if one allows steam to accumulate it must get off sooner or later, and children are under steam always.

The adult, when he becomes a city dweller, takes his nature study in stiff two-weeks' doses, fishing or shooting, plus all the modern gastronomic tidbits



The Boy Who does not Love to Camp is Unique. This Illustrates one of Ernest Thompson Seton's Camps
where Boys Come in Contact with Nature at Her Best



This and Other Illustrations of Homes in This Chapter, Show such Places as
People Make when they Care about Appearances

he can carry, and accumulates a fine crop of scientific fables and sunburn. This is not real rest, not even the best acquaintance with nature; rather it is a sort of primitive spree, inherited in garbled form from tradition as a seasonal necessity. The truly fine side to the nature movement lies in its influence on everyday living through a sound regard for what nature can do at her best, and the resultant modification of taste in general. It is a questionable satisfaction to make a whirlwind campaign into nature's midst for a few short weeks, comfortably supported by the consciousness of urban conveniences in the end, when there is the possibility of bringing nature to our very doors, almost to the hearthstone. Nature is complacent and excellent company when offered a suitable welcome.

The ideal home is ideal throughout — outside as well as in. There is no vital difference between the kind of pride which demands clean linen and that which craves beautiful lawns (to be used however), beautiful flowers (also to be enjoyed), trees and porches for shade and rest. The kind of nature too which really rests and enthuses one is the kind which may be enjoyed for twelve months in the year; in other words, gardens, grounds, and trees

which belong to the climate, to the locality, and, being hardy, commend themselves at all seasons.

But nature is no designer. The landscape gardener and the amateur must, by their united efforts, bring an artistic plan to bear upon nature's offerings, using her trees and flowers and the contour of the ground, and create an environment which pleases. The result should not only be fine of itself, but should furnish a proper and rich background for the house which is the centre. There are in existence numerous periodicals devoted to country living, farming, gardening, animals, sports, and the special suburban problem, and also a very distinguished library dealing with similar types. These have a surprisingly wide circulation, probably because they are as a class guiding the public taste in such matters instead of following it. This literature has in a few short years uncovered a new public interest in matters allied to nature, notably in home architecture and surroundings, and there is distinct evidence at the present time of improvement in architectural style. Domestic buildings are more appropriate in material and design than ever before, and are such as seem to be in tune with the somewhat informal suburban or village surroundings. Formerly architectural style was imported from abroad, and



Even the Most Beautiful House must have a Background to Soften the Conventional
Lines and Areas of Construction



One should Build a House as one Builds a Reputation, Gradually, Allowing Ideals and Execution to Expand and Develop Together. Then the House and Grounds will Appear at Their Best

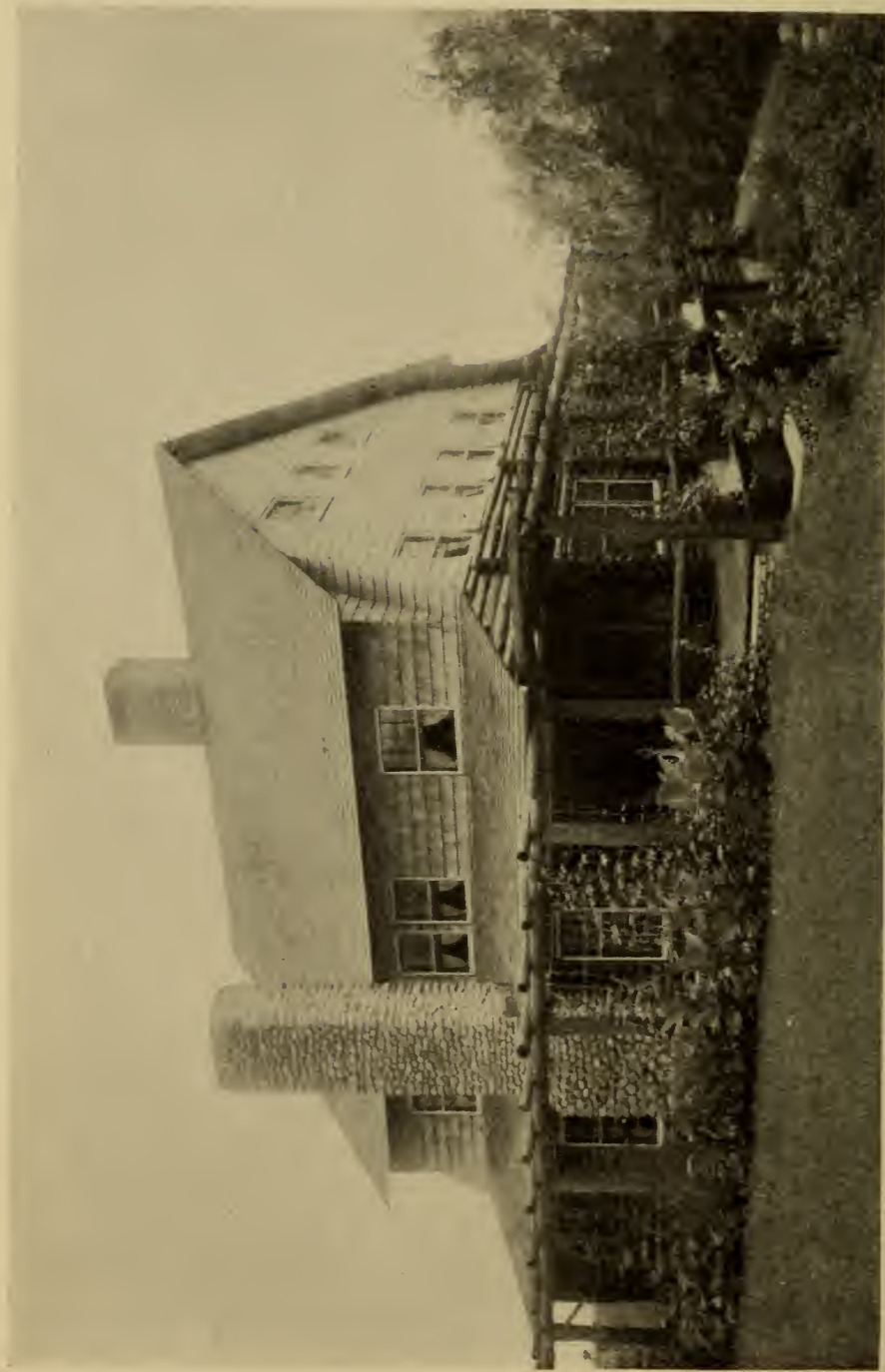
with it came a certain few odd fragments of landscape gardening, full of patterns, floral arabesques and geometric arrangements, imitation Renaissance, urns and alert iron dogs to guard the dooryard. One can still find houses with ugly mansard roofs, stiff, forbidding doorways, and gloomy windows, the whole perched high on a hill, or at least elevated above the street, suggesting in every feature the barrenness of the artificial. It is art at its worst. The effort was further emphasized by the consistent designers through formal, wax-like landscape accessories, tender budding plants, cast-iron benches and garden ornaments, which must surely be blood kin to the modern steam radiator and art cook stove. There was nothing human about such a place: it always suggested the hereafter. But the new, healthy, public interests in outdoors, in a joyous life, have banished those artificial shells and substituted a type of dwelling which is planned for living. And the outside aspect of the house gives one the impression that it belongs to that particular spot, for those people for home purposes. Of course all houses are not so successful, but one finds a good many nowadays. It was bound to come, because when people began to study nature, to live closer to their flowers and animals, to want green lawns

and pleasant hills, they soon sought a type of shelter which would nestle close to the ground and look hospitable and inviting. Architecture and gardening are more closely related than one would first imagine, and it is questionable whether one can deal successfully with one and ignore the other.

In previous chapters the discussion of children and their training has touched lightly upon certain points which may well be elaborated a bit here. Most of the child's waking hours would virtually be spent out of doors; no house is large enough. And it was urged that these intense outside activities would be excellent foci for most profitable study. No yard, however restricted, is too small to accommodate some hobby which will absorb the child's energy and aid in generating constructive skill and judgment. The matter of pocket money is also very important and becomes a powerful motive when properly used. But there is another and more mature point of view concerning the home as a whole, which should not be discarded. *Every child should learn to so respect and value his own personal property and affairs that he will respect those of others, neighbors for instance.* He will not do this unless his own efforts and experiments are taken seriously, or unless his home grounds and living are main-



Trees, Shrubbery and Lawn form the Frame of the Picture, and a Bad Frame will Spoil the Finest Picture



There was a Time Not Long Since, when People Built Houses According to Style. They Now Build for
Pleasure and Comfort, Producing the Finest Style of All

tained at top condition, or unless he grows to appreciate a beautiful physical environment. The lawn, the garden, poultry house and stable ought to be in perfect trim all the time. It is better taste to have them so, and it is good business. One cannot succeed with raising pets or animals in unsanitary quarters, or inadequate shelter. It will not be difficult to develop proper ideas of taste and charm in the grounds about the house if one begins with the boy's and girl's own business and steers that to a decent working basis. Ragged grounds, unkempt lawns, weeds, littered porches and hopeless, tired-looking flowers — all persistent manifestations of neglect—leave on the youthful mind ineradicable impressions which undermine good taste.

Most boys and girls dislike any kind of work which is mere drudgery, and most children in these days shy at work for ends other than their own, because they have found that they can have privileges and amusements without responsibility or other return to their parents. The solution lies in the restoration to the boy of a feeling of personal responsibility and pride, restoring to him and his sister the rights of ownership to things and privileges earned, and make the children something other than social puppets. Make their youthful occupa-

tions count. Among those occupations one finds a number which are equally fascinating to both children and adults.

Probably no accessory to the home is more to be valued than the garden, especially the flower garden. It adds so much of color and variety to the whole scheme, and helps to bring the house into intimate relation with the grounds. The finest gardening has probably been due to feminine influence, and every girl can draw from practical experience with growing things a delicacy of taste and wealth of knowledge to apply to ends peculiarly her own. The latent intuitive feminine outlook often remains undeveloped in these days, and no craft will preserve and stimulate it more than gardening. There is a reaction just now against the formal flower beds of tender plants, a patch of exotic color dotting otherwise irreproachable lawns, though the florist would like to keep such arrangements in fashion, for he is seldom a true artist. But better standards of living, a fresher study of nature, a more personal, intimate architecture, have brought into them many of the old garden ideals where the garden belonged to the mistress of the house and showed it. The garden has a most significant history. It has always been a centre of family life, and among the Romans was



Courtesy of Miss Annie Washburn

A School Garden. If Children Cannot Expand at Home, the Public School is Under Obligation to Satisfy
the Need for Outdoor Occupation



Courtesy of Prim. F. C. Clifton

A School Garden. Watchung School, Montclair, N. J.

in fact the element about which the household revolved. Here the family rested and visited, worked and played. The dwelling was built around it, with living rooms which opened on its walks and fountains, bringing the family together in the most intimate way. The early Dutch and English colonists brought to America a similar taste for this soothing adjunct to the home and early put into effect such garden plans as their limited resources permitted. And always it has been the women-folk of the community who have kept the garden alive with persistent belief in its harmonizing influence on the family. Not infrequently the children learned their first lessons in business, in ownership and in responsibility, there. Gardening is one of the oldest and simplest of crafts and may not be overlooked in seeking a pathway for youthful energy.

Perhaps the boy or girl would rather grow fruits or berries, vegetables, raise pigeons, keep bees — one and all are equally good. This is the essential fact: every boy and girl should come into direct and positive contact with some of the important natural phenomena and life. Growing things have to be cared for, they must have food, water and protection. One cannot play with them when one feels like it; they need attention every day. The obli-

gation is a pleasant one, but nevertheless it is an obligation and gives a much needed lesson in a way that sticks.

Any occupation around the home, if it be one which ministers either to the pleasure, comfort or profit of individual members, is quite likely to knit that family into a more compact group. It keeps the children more at home. The interchange of service and advice which brings into relief the interdependence of the individuals stimulates this one of the important characteristics of domestic society. There has been an indication in recent years to lay upon the schools the entire training for manhood and womanhood. It is expected to teach manners and ethics, to give the proper kind of academic information, to formulate character, to even teach "nature." It is impossible to do this. The finest character, habits of study, executive ability, and the social attitude must be started and nursed to strength, if not to maturity, at home. Five hours each day under incomplete authority can accomplish little else than formal instruction. Even the beginnings of technical and scientific training have their roots deep in these childish hobbies which originate and flourish at home, where a deep obligation rests upon parents to make



There is a Fascination about Raising Animals whether for Sale or as Pets. To the Child this Occupation
Acquires the Dignity of a Real Business



Two More Illustrations which will Suggest Plans for the Future

the most of this early time. It is a lead the school can follow, but never originate. The school represents the average educational ideal of a given community, and when schools are inefficient, languish and give indifferent service, it is an excellent index of the local culture standard. Therefore, when parents develop to their highest pitch the enthusiasms and abilities of childhood, when they foster family life and enrich it so that every member, particularly the younger ones, become active participants, and feel that they too have work to contribute to the general welfare, then and then only will the school by force of public sentiment revise its own standards.

For reasons such as these every home should be a kind of unofficial training school, in which the courses are mostly elective. Some outdoor hobbies which the children will enjoy should be maintained, and, on however small a scale, the house and grounds should be planned with this in view. The city boy and girl will have somewhat limited choice, but even there one can enjoy several hobbies, even in a flat. One can at least grow things, for there are few corners, even in a city, so dark that some plants will not flourish.



CHAPTER VI

VACATIONS, ATHLETICS, SCOUTING, CAMPING, PHOTOGRAPHY

THE boy of to-day is at a real disadvantage in his struggle for health and happiness. He is always a primitive at heart, surging in the direction of direct physical expression, showing almost on the surface the simplicity of savage instincts, to live close to the earth, be outdoors, perform feats of strength and skill, hunt, fish, camp and play at doing the essential acts of life. Through succeeding generations society has perfected a veneer of convention which glosses over the crudities of childish abandon, and as they (children) grow, the polish becomes thicker and more lasting, even so as to make the individual a "ready-to-wear" being. But at intervals, even in adults, one finds the periodic plunge into camp and field. That vacations do not always supply the benefit which doctors would, but cannot, is rather the fault of brevity than of the outings themselves. Boys can,



Every Child, and especialy the Boy, Needs Active Outdoor Exercise.
This kind has much to recommend it



Organized Play (Woodcraft) under Ernest Thompson Seton

as a rule, enjoy vacations without responsibilities, they can have ample scope for the close acquaintanceship with the simplicities of outdoor living. One of the first true signs of summer is the tents and crude shelters in backyards of our suburban villages. It is the nearest approach to a normal, sane existence the child can make. No proper child omits to play "Indian" or "hunter" in his early years, and no youth ever quite outgrows the keen pleasure of sleeping in the open, companioned by the sighing of the night. One recent experience of the writer, camping among the giant redwoods of California, where one could before going to sleep have a last look at the stars framed by the wondrous trees, and drift to unconsciousness to water music in the gorge way down below, was a time never to be forgotten. It is such experiences as these in the open which both keep and restore one's mental balance; they breed cheerfulness and optimism, develop friendships. And the boy is not so very particular about the place, provided there is water and woods, some companions, and things to do. He loves to swim and should learn. He wants to be of some account and have a part in the camp, learn how to make camp, protect things, prepare for weather, engineer the routine of camp life. Probably no institution

outside formal educational institutions is likely to have more vital influence on boys of the future than the Boy Scouts, already mentioned, a marvelous scheme to organize this play spirit. It takes hold of the most primitive instincts in child life, develops them to the highest pitch of efficiency, and turns the enormous energy generated thereby into useful channels by the simplest of devices — service. But be it noted, service for which the need is perfectly plain. The boy gets the finest of physical training imaginable and readily cultivates moral virtues which have been the despair of teachers and parents.

In general, the vacation cannot be more profitably spent elsewhere than outdoors. If a boy cannot actually go into the woods, away from home and the restrictions which modern living must of necessity impose, then the next best thing is pastime or amusement which requires outdoors for a setting. There is much to be said for each and every one of the sports common at the present time, baseball, tennis, football, golf, boating, riding — they are all good — and every healthy child will take part in one or more. Now a book about sport can never teach a boy or girl how to become skilful; it cannot explain the mystery of the golf stroke or pitched curve, but it can and does awaken the spirit of trial and test. It suggests that



More Woodcraft. Has the Boy had a Chance at this kind of Experience ?



Even the Technical Processes of Photography have been Reduced to Popular Terms



In These Days Photography has become so Simplified that every Child can Use a Camera to Advantage

there is possibly a right way to do things; to play even, if one would succeed. The book may tell of the necessity for team work and organization, for system and regular living, and observance of rules made by others. In other words, the book acts through suggestion, very seldom directly; and for the same reason that one gives children books on mechanics, sewing, pets and gardening, that they may learn of the dignity and worth of these occupations, so also does one recommend books of sport and games, which surely are the more valuable when taken in all seriousness. It is through their games, involving dependence upon the confidence in others, that children acquire the best traits of character.

Aside from the inherent return in physical well-being derived from amusement in the open air — one can use this kind of medicine twelve months in the year — such pastime possesses a second quality of no mean importance; it brings one, oftentimes unconsciously, into communication or hailing distance at least of that nature which is so charming. It is easy to see the beauties of birds and flowers and skies, in camp; and the dynamic loveliness of crisp fall weather, even in a great city, is evidenced out of doors by the animation of passersby. But one cannot read about the beauties of beneficent nature;

one must enjoy them personally, and is led on to do so through those pastimes which take place in the open. Several of these have been mentioned, and there is one other: photography.

Photography has almost ceased to be a science; it is a habit. One goes to the store, invests in a comfortably small parcel and a book of instructions which says "press here," and that is about all. The fine succeeding details are minor matters. Whether one merely "presses the button" or goes the whole road and really makes the picture, photography has come to be a regular accessory to sport and enjoyment. No doubt it is evidence of human vanity, but it takes so mild a form and is the source of so much pleasure that the world needs it, to preserve the thousand and one scenes and incidents which comprise the background of life.



INDEX

SYMBOLS USED

- * — ILLUSTRATED
- A — OUTDOOR WORK
- B — MECHANICS, INDOORS AND OUT
- C — CARPENTRY AND WOODWORK
- D — HOME DECORATION
- E — ELECTRICITY
- G — GARDENING
- H — HOUSEKEEPING
- K — OUTDOOR SPORTS
- M — WORKING IN METALS
- N — NEEDLECRAFT

INDEX

	PAGE
Accounts	
balancing	H 90-91, 99
charge accounts	H 98
check book method	H 97
credits, recording	H 96
dairy accounts	A 242
debit and credit	H 90
department method of keeping	H 92-94
housekeeping	H 87-100
How to keep household accounts, by C. W. Haskins, recom- mended	H 99
personal expense account, specimen	H 92
poultry raising	A 168, 172
<i>See also</i> Allowances; Income	
Acorns, care of seed for planting	A 48
Aeronautics. <i>See</i> Aeroplanes; Balloons; Flying machines; Kites	
Aeroplanes	B 158-185*, C 67-83*
balance problem	B 169
biplane	
making toy model	C 68-74*
principle of construction.	B 173-175*
Bleriot monoplane	B 171-173*
engines, types used	B 173
construction principles in general	B 170-171
controlling direction of	B 168-169
gyroscope principle applied	B 169
making models	B 180-184*, C 67-83*
management not difficult	B 177
Maxim's aero-curve	B 166-167*
monoplane	
making a model	B 180-184, C 75-83*
principle of construction.	B 171-173*, 175-177
motive power for toy model	B 182-183, C 72, 81-83
planes	
aspect ratio	B 167, 170
shape of	B 164-168
propeller blades	
making for a model	B 182, C 70-72*
position on machine	B 169-170
Santos Dumont monoplane	B 175-177*
testing a model	B 183
triplane	B 180
Voisin biplane	B 173-175*

	PAGE
Aeroplanes— <i>Continued</i>	
why aeroplanes fly	B 163-168, 195-197
wind velocity table	B 198
wireless telegraph control a possibility	B 169
<i>See also</i> Balloons; Flying machines; Kites	
Ageratum, planting	G 84
sowing and blossoming time	G 161
Agricultural clubs	
book about	A 519
organizing	A 452-454
Agricultural pests. <i>See</i> Insect pests	
Agriculture. <i>See</i> Dairying; Domestic Animals; Drainage; Fertilizers	
and Manures; Flower gardening; Forestry; Fruit gardening; Irrigation; Soils; Trees; Vegetable gardening; Vegetables	
Alaska sable, skunk skin	A 484
Alcohol as a cleaning agent	H 124, 135, 359
Airships. <i>See</i> Aeroplanes; Balloons	
Alarm clocks, electric	E 302
Alfred, King	
story of the burned cakes	H 16
Algae. <i>See</i> Seaweed	
Alligator wrench, making	M 276
Allowances	
how to manage.	H 80
Alloys	
definition of	M 208
Almonds	
food value	H 255
Alternating currents. <i>See</i> Electric currents	
Althea (Rose of Sharon)	
characteristics	G 356
Aluminum	
extraction from clay	E 263
utensils	
advantages	H 202
care of	H 206
Ammeter	E 25-34*
construction	E 25-29
how it measures electricity	E 29-30, 32-33
shunt, use of	E 32-33
Ampere, Andre Marie	
Ampere's rule	E 30- 32
Amusements. <i>See</i> Games; Sports	
Andirons .	
forging	M 363-370*
how to use	H 225
Andrew, Saint	
story of the loaves and fishes	H 32
Anemometer	
making	C 162-165*

PAGE

- Anemone
 Japanese, characteristics G 333, 365
 wood anemone G 343
- Angora goat A 109-110
 book about A 517
- Animals
 feeding motherless animals A 268
 tamed versus domesticated K 177
 training A 248-270
 fear versus kindness A 256-257
 wild animals A 259-263
 See also Domestic animals; Pets; also names of animals, e. g.,
 Birds, Newts, Toads, etc.
- Annealing
 copper bowl. M 21
 definition of M 208
 steel M 307-309
 tools for M 11-12*
- Annals (Plants)
 blooming after frost G 330
 climbing G 331
 definition of G 160
 for cut flowers: table G 329
 for heavy soils: table G 329
 for rocky places: table G 332
 for sandy soils: table G 328
 for shady places: table G 331
 for sunny places: table G 332
 fragrant: table G 330
 self sowing G 331
 value of G 316, 359
 what to plant G 322
- Annunciators, Electric E 68-71*
- Antique furniture. *See* Furniture
- Ants
 development from the egg A 393-395
 garden pest G 283
 habits K 147
 household pests. H 361
- Anvil
 metal workers' tool M 10*
- Apartment houses
 heating by electricity E 125
 how to have a play house in H 8
- Apiculture. *See* Bees
- Apple
 distance to plant trees G 258
 food value H 255
 saving seeds from cider making. A 50
 surplus used for cider vinegar A 413
 wood for canes A 59

	PAGE
Applique	
embroidery	N 198-202
honiton lace	N 237
leather	N 83, 85*
overlaid work	N 200
underlaid	N 201
Apricots, dried	
food value	H 255
April	
birds	K 175
blooming plants	G 364
Aprons, making	N 26-30
bands and strings	N 28-30
gathering	N 26-28*
sewing apron and work bag combined	N 31-33*
Aquarium	
care of sick fish	K 166
cost of ready-made boxes and globes	K 163
feeding fish	K 166
making a water-tight box	K 160-162
stocking a self-sustaining aquarium	K 164-166
what to keep in	K 161
<i>See also</i> Gold fish	
Arago, Francois Jean	
wave theory of light	E 345
Arbor vitæ	
characteristics	C 542
Arbors. <i>See</i> Pergola	
Arbutus	
gathering and conserving	A 93
Arc lamp. <i>See</i> Electric lamp — Arc	
Archery	
practice of	K 329-331
Architecture	
adapting the plan to the purpose	D 6, 13
American city versus country homes	D 365-367
bungalow, plan and elevation	C 465*
dining-room plan	D 9
floor plan	D 8*
hall plan.	D 9
kitchen plan	D 10
living-room plan	D 9
A model house	D 3-33
pantry plan	D 12
plan in relation to decorations and furnishings	D 12-13
principles of design	D 4-5, 13-16
wall areas, considering	D 12
<i>See also</i> Building; Carpentry; Cottages; Foundations; Pergola	
Archimedian screw	B 143-145*, 344*
Armatures	
ammeter armature	E 29

	PAGE
Armatures— <i>Continued</i>	
dynamo armature	E 9, 11-13
Arrowhead (Plant)	
characteristics	G 366
Art	
copyrighting works of art	B 426
Arthur, King	
The King's Kitchen: story	H 20
Artichoke	
indoor planting time	G 233
Arts and Crafts. <i>See</i> Basket making; Bead work; Block printing; Brass work; Copper work; Embroidery; Lace making; Leather work; Metal work; Iron work; Silver work; Stenciling	
Arum (Plant)	
characteristics	G 366
Ash	
characteristics	C 564
strength of wood	C 496
Ash tray	
copper work	M 85*
Ashes	
fertilizing value.	A 433
Asparagus	
insect pests	G 287
Aspidistra	
indoor plant	G 196
Assisi, Saint Francis of.	H 25
Association foot ball	K 331
Aster	
characteristics of New England aster	G 365
half hardy plant	G 317
sowing and blossoming time	G 161
starting	G 137
Athletics	
all around athletic championship	K 328-329
best college record	K 336
Olympic games, events	K 372
rowing record	K 383
training rules	K 11-12
value of	K 5-6
Atlantic cable	
laying	E 65-66
Atmospheric pressure. <i>See</i> Barometer	
Attic playhouse	H 5
Atwater, W. O.	
Principles of nutrition; quotation	H 251
Auger	
bit	C 194*
screw principle	B 156
August	
blooming plants	G 365

	PAGE
Australian boomerang	B 232-234*
Automobiles	
gasolene consumed per mile	B 401
making frame for one and two cylinder motors	B 396-401*
making toy automobile	C 62-66*
Aviation. <i>See</i> Aeroplanes	
Axe	
selecting	K 96-97
Azalea	
indoor plant.	G 197
B	
Babylon	
proposed irrigation works.	B 247
Baby's breath (Plant)	
characteristics	G 329, 365
Bachelor's buttons. <i>See</i> Cornflower	
Backing enamel	
definition	M 208
Bacon	
cuts	H 270
food value	H 250,253
for basting meat	H 357
Bacteria in soils	G 222
Baden-Powell, Sir Robert	
Organizer of the Boy scouts	K 20
Badminton (Game)	K 332
Bags	
braiding	N 295-296*
raffia hand bag	N 272-273*
stenciled	N 81*
Bait	
fish bait	K 130-136
<i>See also</i> Trapping	
Baked beans	
food value	H 257
Baking	
cake	H 303
principles and process	H 283-284
thickness of food	H 276
Baking powder	
composition and use	H 301
how to retain strength of	E 267
Ball	
one old cat	K 375
<i>See also</i> Base ball; Basket ball; Call ball; Cricket; Foot ball;	
Hand ball; Hand polo; Hat ball; Hockey; Japanese fan ball;	
LaCrosse; Polo; Push ball; Racquets; Roley Boley; Skittles;	
Squash; Tennis; Tether ball; Volley ball	
Ball bearings	
principle of	B 28

	PAGE
Balloon vine	
characteristics	G 331
Balloons	
history	B 161-162
making paper balloons	B 369-373*
Balsam	
characteristics	G 332, C 539
gathering	A 65
sowing and blossoming time	G 161
Baltimore belle, story of	N 74-76
Baltimore oriole	
as insect destroyer	A 457
Bananas	
food value	H 255
Band saws. <i>See</i> Saws	
Bandy (Game)	K 332
Bantams	
breeding and care	A 217-218
game bantams	A 217
Bar, Horizontal	
making a pull up bar.	C 270*
Bar pins	
silver metal work	M 171-174*
Barberry	
characteristics	G 355
picking	A 16-17
jelly, receipt	A 17, 18
Barometer	
complex, how to make	B 258-261*
construction of	B 231-232*
inventors of	B 256
purpose of	B 261
simple, how to make	B 256-257
theory of	B 256
water barometer, how to make	B 257-258*
Base ball	K 244-266*, 332-334
art of playing	K 262-263
balls, standard	K 262
base hit	K 333
bases	K 333
bats	K 262
batsmen	
left-handed	K 259
qualifications	K 260
training.	K 250
batting	K 260
captain's duties.	K 249-250
catcher	K 254-255
diamond	K 333
laying out	K 260-262*

	PAGE
Base ball— <i>Continued</i>	
doubtful balls, providing for	K 258
"fan"	K 266
first baseman	K 255
gate receipts	K 264
ground rules	K 265
home run	K 333
innings	K 334
choice of, by contesting team	K 264
manager's duties	K 249
methods, old and modern	K 247-248
national game of America	K 244
nine	K 245, 332
opponent's methods, learning	K 259
outfielder	K 257-259
pitcher and pitching	K 246*, 247*, 251-254
positions	K 245, 333
scores	K 264, 333-334
second baseman	K 256
shoes	K 264
short-stop	K 256
signals	K 248
team, how to organize	K 249
third base	K 257
training rules	K 250
two-bagger	K 334
umpire	K 245
uniforms	K 263
visiting teams, expenses	K 264
what makes a game	K 264
Basket ball rules	K 334
Basket making	
materials for	N 242-243
porcupine quills for	A 69
raffia work	N 250-252, 255-261*
rattan basketry	N 243-248*
reed flower baskets	G 61-64*
sweet grass baskets	A 64
Bass	
bait for	K 135
Basse-taille	
definition	M 208
Basswood	
characteristics	C 560
Basting meat.	H 283, 357
Basting stitches	N 6*
Bath tubs	
cleaning	H 155
sanitation	H 217
Bathroom	
care and cleaning	H 155-156

	PAGE
Baths	
electric shower baths in a summer camp	E 244-247
summer camp device	E 160-162
Bats	
usefulness of	K 149
Batteries, Electric. <i>See</i> Electric batteries	
Bayberry	
description of bush	A 19
dips, making	A 20-21
leaves for sachet	A 65
Baywood	
staining mahogany	C 489, D 230
Bead work	N 278-294*
chains	N 279-285*
curtains	N 292
cushion covers	N 290-293
daisy chains.	N 279-282*
loom, home-made	N 282-284*
portieres	N 290-293
purse	N 285-290*
stringing the beads	N 278
Beam action	C 496
Beams, wooden	
strength of materials	B 45
Bean bag	
rules of game	K 336
Beans	
bush beans, varieties	G 297
experiments in growing	G 119-122
food value	H 250, 254, 255
insect pests	G 288
planting seeds	
depth and distance	G 42
distance of drills apart	G 297
eye downward	G 117
quantity to plant.	G 36
time to plant	G 234
pole beans	
ornamental value	G 296
varieties	G 297
seeds	
age for planting	G 34
germination per cent.	G 33, 233
germination time	G 32
soil	G 119, 296
<i>See also</i> Lima beans; String beans	
Bearings	
anti-friction	B 326 ⁴
Beck-iron	
definition of	M 208
Bedbugs	H 363-364

	PAGE
Bedell, Frederick	
discovery that the same wire carries two currents	E 187
Bedroom	
atmosphere	H 158
care of	
morning work	H 146-155
night preparation	H 154
personal responsibility	H 53
furnishings for a girl's room	H 54
furniture, designs for	D 57-58*
guest room	H 367
<i>See also</i> Beds; Closets	
Bedroom electric heater	E 126*
Bedroom slippers. <i>See</i> Slippers	
Beds	
bough beds	K 65*
camping outfits.	K 64-66*
designs	D 60*, 373*
doll's bed of pasteboard, and fittings	H 11-12
making fittings for a doll's bed	N 50-56*
making up a bed	H 54, 149-155
Bed spread. <i>See</i> Counterpane	
Bee balm (Flower)	
habits and characteristics.	G 333, 347
Bee-hive. <i>See</i> Bees	
Bee-keepers Association, value of.	A 326
Bee stings	
prevention and cure	A 317-318
Beech nuts	
characteristics	A 37
gathering	A 38
Beef	
cuts and their uses	H 268-269
food value table	H 252
Beef tea	
making	H 278
Bees.	A 287-336
books about.	A 518
brood chamber, description	A 302*, 303
what goes on in	A 304-307
buying, hints about	A 294-297
cost of colony	A 288
development from the egg	A 393-395
diseases and enemies	A 322, 325
egg-laying	A 305
feeding, spring and fall	A 321
hives	
arranging	A 292
drone and queen trap at entrance.	A 316*
entrance to	A 303
kinds	A 297, 300-304, 325

PAGE

Bees—*Continued*

modern	A 301-304*
observation hive	A 325, K 169
old-fashioned	A 300
opening	
how to open, and remove frames	A 315-318
reasons for	A 314
putting together	A 298
supers	A 302*
ventilation	A 294
where to place	A 290-291
hiving	A 313-314
honey	
harvesting	A 316
making	A 322-323
plants which supply	A 322
supply for hives	A 319
uses of	A 326
honeycomb cells	A 315-316
how bees work	A 324-325
how to approach the hive	A 303
Italian	A 296
keeping	
how to begin	A 287-290
supplies for first year	A 296-298
life, length of	A 306
locating the hives	A 290-291
marketing the honey	A 326-327
nucleus, meaning	A 296
observation hives	A 325, K 169*
products of the hives	A 322-325
profit in	A 299-300, 334-336
protecting from wind and sun	A 291-292
queen bee	
clipping wings	A 316
locating	A 316
rearing	A 331-333
testing	A 304
runaway swarms, securing	A 288
shipping	A 294
smoking	A 314-315
success with bees: stories	A 328-336
swarm catcher, home-made	A 310-313*
swarming	
reasons for	A 304
time and process	A 307-309
to prevent	A 315
varieties	A 295
wax making	A 323
wintering	A 319-321*
worker bees, development of	A 305-306

	PAGE
Beeswax for cleaning irons	H 317
Beetles	
development from the egg	A 393-395
extermination of pests.	G 117, 285, 287, 292
mounting specimens	A 384*
Beets	
boiling	G 298
cooking preparation	H 293
food value	H 255
insect pests	G 288
planting seeds	G 298
depth and distance	G 42
quantity to plant.	G 36
time to plant	G 234
seed	
age for planting	G 34
germination time	G 32
soil preparation.	G 298
transplanting, to avoid	G 122, 298
Begonias	
bedding plant	G 324
window box plant	G 193
Bell, Alexander Graham	
inventor of the telephone.	E 274
Bellflower	
habits and characteristics.	G 346
Bellicent	
mother of Gareth	H 21
Bellows	
blacksmith's.	M 216*
metal worker's	M 12*
Bells	
brass work	M 145-147*
<i>See also</i> Electric bells	
Belt buckle	
copper work	M 88-90*
designs for	M 195*
Belt pin	
copper work.	D 350*
Belts	
knotted raffia	N 273-274
Irish crochet	N 335-337*
tooled leather, designs and process	D 324-328*
Bench	
double seat for summer house	C 422-424*
riverside	B 158
selection of wood for	C 409
stationary outdoor bench	C 408-409
<i>See also</i> Settees	
Bench hook	
making	C 139-142*

	PAGE
Bench stop	C 139
Bench work. <i>See</i> Carpentry; Whittling	
Berries	
food value	H 255
picking	A 8-20
seasons	A 8
washing	H 295
<i>See also</i> names of berries, e. g., Raspberry; Strawberry; Thimble- berry; etc.	
Bessemer steel. <i>See</i> Steel	
Bethsaida	
Story of the loaves and fishes	H 32
Bezel setting	M 152-157*, 163*, 176
Bicycle	
sprocket wheel	B 327*
Biennials	
definition	G 160
what and how to plant	G 322
Binding edges and seams	N 51*
Biplane	
construction	B 173-175*
making a toy model	C 68-74*
Birch	
aspen leaved	C 558
bark, removing	A 66-67
uses	A 67
black or sweet birch	C 557
blue or hornbeam	C 559
gray	C 558
kinds and characteristics	C 556-559
red	C 557
staining mahogany color	D 230
white, canoe, or paper birch.	C 557
yellow	C 557
Birds	
April birds	K 175
attracting the birds	A 454-459*
bath, making	C 219*
books about.	A 519
crows as pets	K 176
eggs and nests, collecting	A 460
enemies	A 460-461, K 174
flight, theory of	B 195-197
game preserve, creating	A 464-465
houses	
building	C 213-220*, K 174-175
location	C 213
suiting the birds	C 219
supports for	C 218
March birds	K 175
May birds	K 176

	PAGE
Birds— <i>Continued</i>	
migration	K 175
nesting time	K 176
non-migrating	K 176
protecting fruit from	A 461
protection and care of	A 458-459
song birds, attracting	A 454-457
unlawful to cage	K 173
that stay all winter	K 175
traffic in skins	A 459-460
training	A 263-265
value as garden pest destroyers	G 280, A 455-457
Bit and brace. <i>See</i> Carpentry and Woodwork — Tools	
Bites of insects	
treatment of	H 364
Bittersweet	A 56
Black bass	
bait for	K 134
Blacksmithing	M 215-357
equipment	M 215
fuel	M 229
fullering, meaning	M 225
iron used	M 230-232
tools	M 222, 224-226*, 228, 229
<i>See also</i> Forge; Forging; Horseshoeing; Iron work; Temper- ing; Steel; Welding	
Blankets	
campers' outfit	K 66
making for doll-bed	N 54*
washing woollens	H 324, 328
Bleeding heart	
characteristics	G 335, 365
Blood root	
habits and characteristics.	G 343
Blindman's buff (Game)	K 337
Block and tackle. <i>See</i> Pulleys	
Block printing on fabrics	
designs and process	D 99-106*
laundering articles	D 107
materials used for	D 107
Blood stains	
removing	H 360
Blotting pads	
leather, design and making	D 335-338*
metal corners, making	M 122-124*
making and carving hand blotter	C 125-127*
Blow pipe	
metal workers' tools	M 12*
Blowing engines	
diagonal catch and hand gear	B 315
Blue flag. <i>See</i> Iris	

PAGE

Blue printing	
leaves and flowers	A 360-361
Bluebell	
characteristics	G 364
Blueberries	
burning over land	A 13, C 514
canning factories	A 12
picking	A 13
varieties	A 13
where found	A 11, C 514
Bluebird	
insect destroyer	A 456
migration	K 175
Bluets	G 341
Bluing clothes	H 18, 320
Boards. <i>See</i> Lumber	
Boat building	B 84-109*
carvel ribbon built boat	B 89
centre line of shaft	B 90
decks	B 91
dimensions of the <i>Mocking Bird</i>	B 68*
displacement	B 89
exhaust pipe	
fitting up	B 97-98
pet-cock	B 99
under water	B 98-99
expansion chamber	B 98
floor boards	B 91
keel	
block for	B 76
laying and setting up	B 85-87*
keelson	B 86*
knees	B 91
"knock down" system	B 66, 68
launching the boat	B 134, 136-138
laying off the profile	B 90
lettering the name	B 131-132
materials and dimensions	B 90-93*
motor	
dimensions	B 95
installing	B 93-95*
motor bed, fitting	B 91, 97
offsets, table of	B 92
patterns, buying	B 62
plan and section of the <i>Mocking Bird</i>	B 66-68*
propeller shaft, installing	B 93
section of launch	B 89*
sections, spacing of	B 91-92
sheathing	B 89*
skeleton, fitting posts together	B 88*
steering gear	B 346*

	PAGE
Boat Building— <i>Continued</i>	
stem	B 86*, 90
thwarts	B 91
unloading materials	B 84-85
varnishing the boat	B 112
<i>See also</i> Screw propeller	
Boat house building	B 36-64*
covering the frame	B 40
doors and windows	B 37
foundation	B 36*
frame, end and side	B 37-40*
pier, constructing	B 19, 76
roof	B 40-42
slides or ways	B 44-45
Boats	
fishing boats, fitting and cost	K 140
<i>See also</i> Boat building; Canoes and Canoeing; Launch; Screw Propeller	
Bob sled	K 223*
Bob white	
migration	K 176
planting seed birds	A 464
Bo-bo and the roast pig	H 18
Bobolink	
migration	K 176
Bog plants	G 366
Bohnenberger's machine	B 334*
Boiling	
meats and fish	H 278
principle and process	H 277
seasoning	H 279
vegetables	H 279
Boiling point of liquids	H 277
Bolsters	H 152
Bolts	
forging	M 240-244*
Book case	
designs	D 53*, 151*, 177*, C 351*
"knock down" design and construction	D 150-156*
mission style	C 352
staining the wood	D 236, 237
with adjustable shelf, design and construction	C 350-353*
with glazed doors, design and construction	D 176-180*
<i>See also</i> Book rack	
Book cover	
limp leather design and making	D 342-345*
Book mark	
copper work	M 128*
Book rack	
copper work	M 121*, D 351*
folding, designing and making	C 247-249*

	PAGE
Book rack— <i>Continued</i>	
wall rack, designing and making	C 347-350*, D 156-151*
Book shelves. <i>See</i> Book case; Book rack	
Book supports	
copper work	M 121*, D 351*
Books	
care of	H 349
Boomerang, Australian	
making	B 232-234*
Boone, Daniel	
wilderness traveler	K 51
Bootees	
knitted	N 363-366*
Bordeaux mixture	
receipt	G 121, 294
uses	G 282, 288, 291
Boring. <i>See</i> Drilling and Boring	
Bossing up	M 208, 419
Botany	
collecting native plants in California	A 96-98
<i>See also</i> Flower gardening; Flowers	
Bottles	
killing bottle for insects	A 378-380*, K 151*, 154
washing	H 183
Boulder up (Game)	K 345
Boulders	
moving on rollers	B 18-19*
raising	B 15-17*
Bow and arrow	K 329
Bowling	
lawn bowling	K 366
Bowls. <i>See</i> Brass work; Copper work; Metal work;	
Pottery	
Box elder	
characteristics	C 548
Box furniture	C 475-478*
Box kite. <i>See</i> Kites	
Box making	
design to resemble books	C 397*
dovetail joints	C 315-318*
drawing instrument box	C 240*
hinging a lid	C 239
knife and fork box	C 223-226*
nail box	C 206-209*
pencil box, making and carving.	C 106-108*
proportions	C 235
seat and chest combined	C 476*
simple box	C 40*
toilet boxes	C 315-318*, 235-241*
<i>See also</i> Copper work; Inlaying; Metal work;	
Wood carving	

	PAGE
Boy Scouts of America	K 19-49*
activities	K 43
ambulance badge, qualifications for	K 27
aviator badge, qualifications for	K 28
badges	K 27-36
bee-keeper's badge, qualifications for	K 28
blacksmith's badge, qualifications for	K 28
bugler's badge, qualifications for	K 28
campaigning	K 43
camps, routine and model programme	K 46-49
carpenter's badge, qualifications for	K 29
clerk's badge, qualifications for	K 29
cook's badge, qualifications for	K 29
cyclist's badge, qualifications for	K 29
dairyman's badge, qualifications for	K 30
electrician's badge, qualifications for	K 30
engineer's badge, qualifications for	K 30
farmer's badge, qualifications for	K 30
finances	K 41
fireman's badge, qualifications for	K 31
first aid to animals' badge, qualifications for	K 31
first-class tests	K 24-25
founder of society	K 20
gardener's badge, qualifications for	K 31
handy man's badge, qualifications for	K 31
headquarters	K 19
horseman's badge, qualifications for	K 32
interpreter's badge, qualifications for	K 32
laws	K 25-27
leather workers' badge, qualifications for	K 33
life saver's badge, qualifications for	K 38
marksman's badge, qualifications for	K 33
master-at-arms badge, qualifications for	K 33
membership requirements	K 22-25
missioner's badge, qualifications for	K 33
musician's badge, qualifications for	K 33
oath	K 22
official hand book, how to obtain	K 49
origin	K 20
pathfinder's badge, qualifications for	K 34
patrols, forming	K 27, 38-39
photographer's badge, qualifications for	K 35
pioneer's badge, qualifications for	K 35
piper's badge, qualifications for	K 35
plumber's badge, qualifications for	K 35
poultry farmer's badge, qualifications for	K 36
principles of good scouting	K 39
printer's badge, qualifications for	K 36
purpose	K 20
salute and secret sign	K 22
scout craft	K 21, 43

PAGE

Boy Scouts of America—*Continued*

scout master, qualifications and duties	K 26, 42-43
second-class tests	K 23
sign posts for scout master	K 43-46
signaler's badge, qualifications for	K 36
seaman's badge, qualifications for	K 36
stalker's badge, qualifications for	K 37
starman's badge, qualifications for	K 37
surveyor's badge, qualifications for	K 38
swimmer's badge, qualifications for	K 38
tenderfoot, class requirements	K 22
troop, organization	K 26-27, 40-41
Boys' clubs. <i>See</i> Clubs	
Brace and bit. <i>See</i> Carpentry and Woodwork — Tools	
Bracelets	
silver work	M 174-177*
Bracket	
brass work	M 146-147*
iron work	M 393-395*
wood	
corner bracket.	C 246*
designs	C 242-244*
making	C 245
Braiding	
coronation braid	
daisy pattern	N 109-111*
what it is and how to sew it on	N 108-109*
fastening the ends of the braid	N 107
flat braid, how to sew it on.	N 108
rugs and mats	N 296
soutache braid	N 107
stamping the design	N 107
weaving	
four strands	N 295*
how to begin	N 295-296*
joining a new strand.	N 296, 298*, 301
on frame	N 296-301*
six strands	N 296*
Braising	H 280
Brass	
cleaning	H 135, M 140
coloring blue black	M 205
coloring green	C 379
composition and characteristics of	M 133
tarnish, to prevent	M 140
Brass work	M 133-147*
bell and bracket	M 145-147*
bracket	M 146-147*
crumb tray and scraper	M 135-136*
finger bowl	M 133-135*
handles to vase, making	M 148

	PAGE
Brass work— <i>Continued</i>	
soldering a vase	M 144
tea caddy	M 136-140*
vase	M 140-145*
weighting a vase	M 143
<i>See also</i> Copper work; Metal work	
Brazilian point lace	N 238*
Brazing metals	M 310-315
preparation of parts and process	M 311-314
value	M 314
Bread	
baking	H 283
brown bread, food value	H 257
camp cooking	K 87-88
curled bread for camping.	E 303
food value	H 250, 254, 300
freshening dry bread	H 354
ingredients, purpose of	H 298-299
kneading.	H 299
mixing	H 299
raising	H 300
setting	H 299
unleavened	H 300
yeast for.	H 296-297
Bread board	
making	C 222-223*
Breakfast food	
food value	H 254
left overs	H 355
Breeding	
purpose and standards	K 177
skill in breeding Dutch belted varieties	K 184
<i>See also</i> Domestic animals; also names of animals, e. g., Horse;	
Poultry; Swine etc.	
Bridges	
building a foot bridge.	B 70-73*
Brier stitch. <i>See</i> Feather-stitching	
Broilers. <i>See</i> Electric broilers; Poultry raising	
Broiling	
process and utensils	H 275-276
Brooches	
silver work	M 171-174*
Brooders	
making	K 199
Brook trout	
bait	K 136
reclaiming a trout stream	A 271-273
Broth. <i>See</i> Soups	
Brother Juniper's cooking: story	H 25
Brown bread	
combinations for food values	H 257

	PAGE
Brushes	
paint brushes	H 342
stenciling brushes	N 79-80*
<i>See also</i> Commutators (Electricity)	
Brussels sprouts	
soil and planting	G 299-300
Brussels stitch	N 229-231*
Buckeye tree	
characteristics	C 565
Buckles	
belt buckles, making	M 88-90*, 195*
turn buckles, forging	M 324, 330-334*
Buckthorn for hedges	G 357
Buckwheat	
cakes and sausage, food value	H 258
food value	H 254
Budding plants	G 250-253
Buffet	
design	D 56*
Building	
base boards	C 475
batter boards, posts and sills	
setting	D 25
cheap finishings	C 475
chimneys, style of	C 472
construction	
boat house details	B 36-42*
house details	D 25-32*
cornice detail	D 29*
flashing chimneys	C 472
interior finish details	D 31*
joists, placing	B 39
model house	D 3-33
rollers for moving heavy weights	B 44
sills, setting	D 26-28*
walls, finishing	C 472
woods and their uses	C 536
working drawings for	D 21-23
<i>See also</i> Architecture; Bird houses; Boat building; Boat house;	
Carpentry; Columns; Doors; Floors; Foundations; House	
framing; Joints; Pergola; Poultry house; Summer house;	
Strength of materials; Windows; Wood	
Buildings	
wrecking	B 12-13, 43
Bulbs (Metal)	
forging iron bulbs	M 385-388*
Bulbs (Plant)	
California bulbs, collecting and cultivating	A 94-99
bedding plants	G 171, 324
blue flowers, list	G 178
colors, list	G 177-179

	PAGE
Bulbs (Plant)— <i>Continued</i>	
drying and storing	G 176
easiest to grow	G 166
flat for, making	G 61*
forcing varieties	G 171
insect pests	G 293
outdoor planting, soil preparations	G 170
planting, hints	G 171
planting in lawns	G 360, A 169, 434
potting for winter, soil and drainage	G 171
red flowers, list.	G 179
resting time	G 173
to prevent plants from blossoming low down.	G 175
transferring to light and heat	G 174, 175
water bulbs	
care and development	G 175
when to buy	G 167
white flowers, list	G 177
winter care of	G 139
yellow flowers, list	G 178
<i>See also</i> Canna; Chinese lilies; Crocus; Hyacinths; Narcissus;	
Tulips	
Bulgarian drawnwork	N 222-226*
Bull in the ring (Game)	K 337
Bungalow	
plan and elevation.	C 465*
Bunsen burner	M 11*
Burdock	
class and seed time	G 278
destroying	A 471
distribution of seed	G 273
Bureau drawers	
arrangement and care of contents	H 53-54
doll's playhouse in	H 9
Burgees	B 108
Bur-marigold (Beggarticks)	
class and seed time	G 278
Burned wood. <i>See</i> Pyrography	
Burns	
care of	H 364
Burroughs, John	
love for birds	A 263
Butcher knife. <i>See</i> Knives	
Butt joints	C 251*
Butter	
food value	H 250, 254
how to judge butter	H 271
Butterflies	
breeding	A 398-400
classifying a collection	A 386
collecting	A 381-384*, K 151-153

	PAGE
Butterflies, collecting— <i>Continued</i>	
series to illustrate development	A 395-397
time for	A 388
development from the egg	A 393-395
killing bottle and how to use it	A 378-380, K 151*, 154
mounting a collection	A 381-386*, K 153*
net for catching	K 151*
Butterfly weed	
habits and characteristics	G 348, 365
Buttermilk	
cleansing properties	H 356
Butternut tree	
characteristics	A 36, C 564
Buttonball tree	
characteristics	C 562, G 79
Buttonholes	N 58-62*
cutting	N 62
loops, making	N 62*
stitch	N 58*
tailor-made	N 59*
thread for	N 58, 62
Buttonholing	
blanket stitch	N 142*
finishing edge	N 130, 133
Hedebo embroidery	N 202-206*
honeycomb stitch	N 144*
knotting thread, to avoid	N 131
Mount Mellick	N 143
padding	N 130-131
Roman cut-work	N 138-142*
American stitch	N 139*
European stitch	N 139-140*
scalloping	N 132*
cutting out	N 133
triangular buttonholing	N 143*
<i>See also</i> Wallachian embroidery	
Buttons	
sewing on	N 4-6*
Buttonwood	
characteristics	C 562
Buying. <i>See</i> Marketing	
C	
Cabbage	
bleaching heads	G 126
cooking preparations	H 293
family	G 299
food value	H 255
growing	G 123-128
harvesting	G 126
indoor planting	G 233
insect pests	G 125, 288

	PAGE
Cabbage— <i>Continued</i>	
planting seed	
depth and distance to plant	G 42
early and late crops	G 124
quantity to plant	G 36
time to plant	G 234
savoy variety for poor soil	G 301
seed germination	
per cent.	G 233
time required	G 32
soil requirements	G 19, 301
storing	G 127
Cabinet	
with drawers, making	C 209-212*
with shelves and glass doors, making	D 176-179*
<i>See also</i> Filing cabinet; Medicine cabinet; Tool cabinet	
Cabinet work. <i>See</i> Carpentry and Woodwork	
Cables, submarine	
laying the Atlantic cable	E 65-66
number in operation	E 66
rates	E 67
Cactus	
use of pitch	A 64
Cahill, Dr.	
inventor of Telharmonium	E 293-295
Cake	
baking	H 303
freshening dry cake	H 351
making	H 301-303
substituting lard for butter	H 355
Calcimine	
cleaning walls	H 122
Calendar back	
whittling.	C 18*
Calendula	
sowing and blossoming time	G 161
Calf	
beef versus dairy feeding	A 121
diseases	A 120
fattening	A 121
feeding	A 119-122
raising	A 118-126
teaching to drink	A 119
training to lead	A 121, 258
watering	A 122
Calfskin	
for leather work	N 84
California bulbs	
collecting and growing	A 94-99
California poppies	
sowing and blossoming time	G 161

PAGE

Calipers .	
blacksmiths' tools	M 225
Call ball	K 338
Caloric theory of heat	E 342
Calves. <i>See</i> Calf	
Cambium	A 441
Camelot	H 20, 22
Cameras	
kinds and cost	K 303-304
lenses.	K 307
Camp stool	
making	C 406-408*
Camphor for packing	H 347, 349
Camping	
beds	K 64-66*
blankets	K 66
bough bed	K 65*
Boy Scouts' camp	K 46-49
brush leanto	K 69*
clothing	K 71-74
cooking	K 75-92*
bread	K 87-88
coffee	K 87
fish	K 89, 90
frying	K 91
game	K 89, 90
Indian meal	K 88
johnny cake	K 88
left overs	K 89
meat, time	K 90
rice	K 90
rules	K 86-92
utensils	K 82-83
vegetables	K 89, 90
drainage problem	K 57
electric lights, installation and cost.	E 162-169
fireplaces, building	K 78-79
fires	
for cooking	K 77-82*
gypsy rig	K 79
hunter's fire	K 78-79
lighting in the rain	K 68
making	K 67-69
that will burn all night	K 68, 78*
firewood, providing for	K 55-56
fitting up an old mill	E 160-161
food, care of	K 85-86
girl's work in	K 323-324
hints for comfort	K 71-74
locality, choosing	K 53-54
mosquitoes, protection from	K 70

	PAGE
Camping— <i>Continued</i>	
outfit	K 58-74*
ovens	K 80-82*
principles of	K 50-54
selecting a leader	K 53
shower bath device	E 161*
site, selecting	K 54-58
sleeping bag and head shelter	K 52*
tents	K 58-60*
pegs, securing	K 60
pitching	K 61-64*
sod cloth	K 61
water supply device	K 54-55*
Canadian pine	C 536
Candleberry	A 18-19
Candles	
bayberry dips	A 20-21
shades, making from cardboard and paper	D 358*
Candlestick	
copper work	M 47-56*
pottery, designing	D 313-315*
spiral, iron work	M 388-391*
wrought iron, making	M 380-383*
Candytuft	
annual	G 322
characteristics	G 330, 332
sowing and blossoming time	G 161
Cane rush	K 338
Canes	
woods used for	A 59-60
Canna	
bedding plants	G 324
planting bulbs	G 139, 159
planting seeds	G 159
Canning and preserving	
elderberries	A 16
Canoe tilting (Game)	K 339
Canoeing	K 240-243*
accidents, avoiding	K 242
girl's sports	K 321
Indian model canoe	K 240*
paddling	K 242-243
sailing canoes	K 241-243*
Canterbury bell	
biennial	G 322
Capstan	B 79, 347*
Car springs	B 264-265*
Carafe	
washing	H 183
Carbohydrates	
effect of boiling processes	H 277

PAGE

Carbohydrates—*Continued*

food composition	H 248
in vegetables	H 250
proportion in diet	H 249, 252

Carbon bisulphid

insecticide	G 283, 289
-----------------------	------------

Carbon filaments. *See* Electric lamps — Incandescent

Carbonic acid

as leaf food	G 242-243
------------------------	-----------

Carbureter

.	B 95*
-----------	-------

Card, Leslie E.

How I started with hens	A 168-172
-----------------------------------	-----------

Card case

making and embroidering	N 183-186*
-----------------------------------	------------

tooled leather, design and making	D 338-340*
---	------------

Card tray

copper work	D 355-358*
-----------------------	------------

Carpentry and Woodwork

beveling	C 147*
--------------------	--------

gage device for	C 260
---------------------------	-------

bill of material, value in making	C 189*, 206
---	-------------

board feet, estimating	C 503
----------------------------------	-------

construction	C 250-257
------------------------	-----------

curved rails, making	D 183
--------------------------------	-------

curves, cutting with gouge	C 258-260*
--------------------------------------	------------

cutting up old lumber	B 75-76
---------------------------------	---------

doweling	D 134
--------------------	-------

dressing down lumber	C 144-147, 186-190
--------------------------------	--------------------

estimating lumber	C 498-509
-----------------------------	-----------

gaining-in shelves	D 153*
------------------------------	--------

glued-up work, joining	D 134-136*
----------------------------------	------------

gluing

joints	D 140-142*, 144-146
------------------	---------------------

mitre joints	C 232-234*
------------------------	------------

process	C 225
-------------------	-------

gouge work	C 258-265*
----------------------	------------

grooves

chiseling	C 207-208, 211
---------------------	----------------

cutting	C 110-111*
-------------------	------------

gouging	C 258-260*
-------------------	------------

joint edge, meaning	C 186
-------------------------------	-------

joints. *See* Joints in main alphabet

mathematics of woodwork	C 498-509*
-----------------------------------	------------

mortise, cutting	D 154
----------------------------	-------

nails

holding power	B 46-47
-------------------------	---------

sinking	C 208*
-------------------	--------

outdoor carpentry	C 457-480*
-----------------------------	------------

panels

for desk	D 184-187*
--------------------	------------

for door	C 354-355, 528-530
--------------------	--------------------

Carpentry and Woodwork, panels—*Continued*

PAGE

original purpose of	C 528-530*
planing	C 146, D 133-134, 136
position for planing	C 178
surface planing and taking out wind	C 179
use of shooting board	C 106*
rabbling	C 210-211
sand papering	D 187
shop equipment	C 133-149*
grindstone	C 181-184*
lumber rack	C 150-154*
nail box and cabinet	C 206-212*
tool box, making	C 226-227*
tool chest and cabinet, making	C 339-346
work bench, types	C 134-138*
spokeshave work, examples	C 126*, 266*, 271*
squaring up stock	C 144-147, 185-190*
stock, selection and preparation	D 130-133*
systematic plan in working	D 138-139
testing grain of the wood for strength	C 245
truing up	C 148-149, D 136-138*
undercutting	C 263-264*
warping, to prevent	D 135*
working face of lumber	C 186
<i>See also</i> Building; Doors; Floors; House framing; Joints; Lum- ber; Polishing; Rustic furniture; Stains and staining; Strength of materials; Whittling; Windows; Wood; Wood finishing	
Carpentry and Woodwork — Problems	
box furniture	C 475-478*
brackets	C 242-246*
bread board	C 222*
camp stool	C 406-408*
chest and box seat combination	C 476*
checkerboard	C 332-338*
clock cases	C 276-290*
coat hanger	C 266*
couch hammock	C 478-480*
drawers, making	C 206-210*, 359*
drawing board	C 24*, 381
foot stools	C 291-300*
mission style	C 374-375*
handles for hatchet and hammer	C 271*
hinges, setting	C 239
household utensils	C 221-226, 272-273*
knife and fork box	C 223-226*
ladle	C 272*
linen chest	C 377-380*
magazine rack	D 52*, 165-170*
mechanical drawing outfit	C 381-398*
medicine cabinet	C 354-360*
mitre box	C 228-231*

PAGE

Carpentry and Woodwork—Problems—*Continued*

Morris chair	D 50*, 188-193
nail boxes	C 206-212*
pen and ink trays	C 258-264*
pin tray	C 264*
rustic furniture	D 209-211*
sugar scoop	C 272*
toilet boxes	C 315-318*, 235-241*
tool cases and chest	C 226-227*, 339-344
tool rack	C 341*
towel rack	C 274*
towel roller	C 267-269*
umbrella stand	D 161-165
mission design	C 375*
<i>See also</i> Bird house; Book case; Book rack; Box making; Building; Chairs; Desk; Doors; Floors; House framing; Inlaying; wood; Joints; Mechanical drawing; Mission furniture; Pergola; Picture frames and framing; Plant stands; Poultry house; Settees; Stains and staining; Tables; Tabourette; Toy making; Whittling; Windows; Wood; Wood carving; Wood finishing	

Carpentry and Woodwork — Tools

auger bit	C 194*
bench hook	C 139-142*
bench stop	C 139
bit and brace	
“chuck”	C 193
extension bit	C 195*
ratchet attachment for corners	C 196
types	C 193-197*
boring tools	C 193-198*
braces, making	C 148
cases and cabinets, making	C 226-227*, 339-346*
centre bit	C 193*
chisels, socket and tang	C 207*
clamps, devices for	C 201*
coping saw	C 20*
cutting tools, construction and action	C 169
dowel bit	C 194
draw knife	C 216*
drill bits	C 196
drills	C 193-198*
dulling edges on old lumber	B 75-76
files, kind and uses	C 204
Forstner bit	C 196*
gimlet bit	C 194*, 196
gouge	C 258-260*
hammers	C 203*
hand screw	C 200-201*
using	C 224-226*
mallet	C 200*
mitre box	C 228-231*

	PAGE
Carpentry and Woodwork—Tools—<i>Continued</i>	
nail set	C 208*
oil stone	C 183*
planes	C 176-184*
pliers	C 199*
quality	C 133
rack	C 341*
rules	C 205
saw horse, making	C 143-149*
saws	C 169-175*
screw driver	C 199*
screw driver bit	C 195
sharpening	C 179-184*
shooting board	
how to make	C 189*
how to use	C 106*
spirit level	C 205*
spokeshave	C 126
square, steel	C 205*, M 5*
surface plate	D 136
template	C 264*
vise, quick action	C 138*
winding sticks	D 137*
Carpets	
cleaning	H 128
storing	H 348
<i>See also</i> Rugs	
Carriages	
cleaning	A 408
Carrier pigeons	K 180
Carrot	
planting seed	
quantity to plant	G 36
time to plant.	G 234
seed	
age for planting	G 34
germination period	G 32, 233
soil for	G 301
thinning plants	G 301
varieties	G 301
wild carrot	G 273, 278
Carving	
shelf fungi	A 62
<i>See also</i> Wood carving	
Case hardening	M 308-310
Cast-iron	
brazing	M 312
Castors, Acme pin	D 193
Cat	
characteristics	K 170-173
Cat (Game)	K 339

PAGE

Cat-stitch	
embroidery stitch	N 102*
Cat-tail	
characteristics	G 366
Catalpa	
characteristics	G 367
ornamental value	G 353
Catbird	
insect destroyer	A 456
migration	K 175
Caterpillars	
collecting specimens	A 395
garden pests	G 282, 285, 287, 290
Cauliflower	
cooking, preparation for	H 293
growing	G 299
insect pests	G 289
seed, germination per cent.	G 233
time to plant	G 234
Cavies	
care of pets	K 183-184
raising for pets	A 206
varieties	K 183
Cedar	
red	
characteristics	C 541
durability	C 494
white, characteristics	C 541
Cedar bird	
migration	K 175
Cedar chest	
making	C 377-380*
Ceiling	
as reflector	H 121
care of	H 121
decorations to correct defects of height	D 38
Celery	
blanching	G 132
fertilizer for	G 131
food value	H 255
insect pests	G 287, 290
planting plants	G 131-132
planting seeds	G 302
indoor planting time	G 233
seed	
age for planting	G 34
germination per cent	G 233
germination period	G 32
soil for	G 131, 301
substitutes for, in salad	H 358
transplanting	G 302

	PAGE
Celery— <i>Continued</i>	
trenches for	G 131
Cellar	H 208-213
care of	H 212
cleaning walls	H 210
materials for floor and wall.	H 208, 210
must, preventing	H 212
racks for barrels and pans	H 213
rooms and equipment	H 210-211
ventilation	H 208
windows	H 208
Cells. <i>See</i> Electric batteries	
Cellular kites, making	C 91-92*
Cement	
cellar walls	H 208
coloring for pottery	D 208
columns, building	C 438-440
dams	B 246-247
engraver's receipt	M 205
floors, making	A 137
foundations	
boat house	B 36
house	C 459
pergola	C 426-433
lining pond	G 135-136
mixing for floors and walks	A 137, B 20, 32, C 432, G 135
Portland, origin and uses.	B 246-248
retaining walls, riverside	B 238-245
Cement blocks	
making	B 242-245
Cement furniture	D 201-209*
color for inlaid designs	D 208
decoration	D 207*
finishing coat	D 206
scratch coat, making and laying	D 204
wire forms for, making	D 202-203
Cement walks	
floating operation	B 33
jointing	B 34
laying out	B 9-12
leveling	B 30*
materials.	B 19-20, 32
roots, danger from.	B 15
sides, making	B 30*
tampers for	B 31
trench digging and filling.	B 14, 29-30, 32
Centigrade scale	B 262
Centre punch. <i>See</i> Punch	
Chafing dish, electric	E 113*
Chain-stitch	
crocheting	N 308*

	PAGE
Chain-stitch— <i>Continued</i>	
embroidery	N 99-100*
Chains	
welding iron chains	M 250-253*
adding links	M 253
<i>See also</i> Bead work; Necklace	
Chairs	
box furniture making	C 476*
camp stool making	C 406-408
dining-room, design	D 54*
Duxbury design	D 59
hall chair, design	D 48*
kitchen furniture	H 196
Morris chair	
designs	D 50*, 189*
making	D 188-193*
<i>See also</i> Bench making; Settees	
Chalk	
French chalk	H 332, 360
lime composition	G 216
Chamber work	H 146-159
Chamois gloves	
washing	H 331
Chamois skin	
for leather work	N 84
Champleve	
definition	M 208
enameling	M 202
Chanterelles, mushrooms	A 89
Character	
influence of occupations on	A 6
Charcoal	
how made	M 230
purifying qualities	H 242, 354
Charge accounts. <i>See</i> Accounts	
Chasing metals	
definition of.	M 209
Chassis. <i>See</i> Automobiles	
Checkerboard	
designing and making	C 333-338*
table, making	C 337*
woods to use	C 332-333
Cheese	
food value	H 254
Chemical elements	
of food	H 248
of the human body	H 247
Cherry tree	
characteristics of the wild or black variety	C 561
seeds, care of	A 48
wood for canes	A 59

	PAGE
Chest	
making a box seat combination	C 476*
making a linen chest	C 377-380*
<i>See also</i> Tool boxes and chests	
Chesterton, G. R.	
keeping good health: quotation	H 244
Chestnut	
characteristics of tree	C 562
chinquapins, characteristics	A 32-33
cultivating	A 31
disease	A 30
durability of the wood	C 494
food value	H 255
grafting trees	A 31
Japanese, hardy variety	A 30
varieties	A 30
weevil, pest	A 33
wood finish	
antique	C 489
fuming	D 233
Chicken house. <i>See</i> Poultry houses	
Chickens. <i>See</i> Poultry	
Chickweed	
class and seed time	G 278
Chimney, house	
cold, meaning of	H 224
fire, extinguishing	H 234
"flashing"	C 472
<i>See also</i> Flues	
China aster	
characteristics	G 329
Chinese lilies	
water bulbs	G 168, 175
Chinese windlass	B 81
Chinquapin	
characteristics	A 32-33
weevils, pest	A 33
Chip carving. <i>See</i> Wood carving	
Chisel	
cape chisel, making	M 299*
cold chisel, hardening and tempering	M 293
making	M 298*, 325*
what used for	M 225*
hot chisel	
making	M 324*
what used for	M 225*
metal work tool	M 9*
sharpening.	C 179-184*
silver work tool, making	M 157-158*
socket and tang, how to use	C 207-208*
stone chisel, forging	M 341-344*

	PAGE
Chisel— <i>Continued</i>	
wood chisel, forging	M 337-338
Chlorinated soda	
ink stain remover	H 359
Chocolate	
food value	H 256
Christmas greens	
collecting and marketing	A 50-57
Christmas tree	
harvesting	A 53
oak trees transformed	A 51
Chrysanthemum	
back ground plants	G 321
characteristics	G 335
time of blooming	G 322
Chuck ribs	H 268
Cider	
wastefulness in making	A 50
Cigar box	
copper decorations	M 84*, 85
Cigar lighters, Electric	E 115*
Circle	
how to draw	C 28-30*
Citizenship	
training for	A 449-451
City water supply. <i>See</i> Water works	
City yard	
making and cost of a garden	G 23, 134-141
Clamps	C 201*
Clams	
cooking	H 291
food value	H 254
testing	H 291
washing	H 291
Clap boards	
for siding	C 445
removing	B 12
Clarkia	
characteristics	G 328, 332
Claw tool	
making	M 353*
Clay. <i>See</i> Soils	
Clay modeling. <i>See</i> Pottery	
Cleaning	
delicate colors and textures	H 332
restoring color taken out by an acid or alkali	H 361
stains and spots on fabrics	H 358-361
woodwork	H 123
<i>See also</i> Brass; Carpets; Curtains; Embroidery; Flues; Fur-	
nace; Furniture; House cleaning; Matting; Pictures; Rugs;	
Shades; Tiles; Vegetables; Walls; Vacuum cleaners	

	PAGE
Cleft grafting. <i>See</i> Grafting	
Clematis	
decorative value	G 359
Japanese, characteristics	G 365
Clippings	
making envelope file	N 187-189*
Clocks	
cases, making	C 276-290*
clocks for cases, selecting	C 276
electric clocks	
alarm clocks	E 302
master clock	E 77-78
operation	E 75-78
program clocks	E 77
self winding	E 76
watchman's time detector	E 78*
fastening the clock into the case	C 282*
grandfather's clock, design and construction	C 284-290*
hall clock, design and construction	D 193-198*
wood finish	D 237
mantel clock, design and construction	C 282-284*
mission style, design and construction	C 277-278*
pendulum clock case, design and construction	C 281-282*
pulley mechanism	B 310*
wall clock, design and construction.	C 279-281*
<i>See also</i> Watches	
Cloisonne	
definition of	M 209
enameling	M 201
Closets, Clothes	
cleaning and care	H 53, 157
window in	D 12
Closets, Toilet	
cleaning bathroom toilet	H 155
sanitary equipment and care of outdoor closets	H 222
Closing the house	H 349-351
Clothes basket for laundry	H 315
Clothes-horse	H 318
Clothes line, care of	H 311
Clothes pins, care of	H 315
Clothes poles	H 315
Clothes press. <i>See</i> Closets, Clothes	
Clothing and dress	
art and fashions	D 122
being well dressed	D 122-125
business women's attire	D 127
camp outfit	K 71-74
care of	
importance	H 57
in bureau drawers	H 53-54
in closets	H 158

	PAGE
Clothing and Dress, care of— <i>Continued</i>	
responsibility for	H 53
children's attire	D 127
color in	D 124
decorative principles	D 121
girl's equipment for outdoor sports	K 319-320
harmony and good lines	D 123
proportion of income assigned for	H 74, 76, 78
<i>See also</i> Dressmaking; Sewing	
Clouds	
cumulus	B 365
formation	B 356-357
hail clouds	B 366
Clubs	
agricultural, organizing	A 452-454
garden club	G 3-16
outdoor club	A 451-454
science club	E 339
sewing club	N 11
wireless club	E 331-332
<i>See also</i> Boy Scouts of America	
Coal	
bituminous, value of	M 229
estimating energy in	E 6
specific gravity	B 279
supply decreasing	E 6
<i>See also</i> Fire making	
Coasting	K 223
luge-ing	K 371
Coat hangers	
making	C 266*
Cocklebur	
class and seed time	G 278
Cockroaches	H 362
Cocoa	
food value	H 256
Cocoanuts	
food value	H 255
Cocoon. <i>See</i> Silkworms	
Codfish	
combinations for food value	H 257
food value	H 253
Codling moth	
woodpecker enemy of	K 168
Coffee	
camp cooking	K 87
Coffee mill	
mechanical principle of	B 307-308*
Coffee percolator, Electric	E 113*
Coffee pots	
care of	H 207

	PAGE
Coffee stains	H 359
Coffee tree, Kentucky characteristics	C 566
Cold chisel. <i>See</i> Chisel	
Coldframe	
changing to a hotbed	G 38
directions for making	G 48-50*
drilling the rows	G 98
planning	G 19
soil and location	G 97
storage for endive	G 305
transplanting from	G 101-102
Coleus	
bedding plant	G 324
Collar	
metal work appliance	M 209
Collar, dress. <i>See</i> Dressmaking; Irish Crochet	
Collar slides	
silver work	M 170-171*
Collecting. <i>See</i> Insects; Plants; Seaweed; Shells	
College athletics	
best records made in intercollegiate contests	K 336
College education	
earning	A 3, 7
Color	
due to wave length	E 315
in dress	D 124
restoring to fabrics	H 361
<i>See also</i> Floral decoration; House decoration	
Colts. <i>See</i> Horses	
Columbine	
habits and characteristics.	G 341, 364
Columns, concrete	
constructing and setting for pergola	C 434-440*
Combs	
silver work	M 194-196*
Commutation (Electricity)	
brushes	E 36
principle of	E 35-36
Compass	
use in drawing	C 28-30
Compost. <i>See</i> Fertilizers and manures	
Concrete. <i>See</i> Cement	
Cones. <i>See</i> Pine	
Conic sections	
describing	B 338*
Coniferous trees	C 535-542
Conservation of natural resources	
conserving nature's crops	A 92-94
<i>See also</i> Forestry	

PAGE

Cook		
duties	H 109, 112	
Cook book		
making from books and magazines	H 284	
Cookery	H 274-308	
camp cookery	K 75-92*	
definition	H 274	
emergencies	H 354-357	
freshening bread or cake	H 353	
left overs, utilizing.	H 355, K 89	
mixtures, principles of	H 296-305	
preparation of foods for	H 285-305	
processes	H 275-285	
purpose of	H 275	
sequence of work in getting a meal	H 305-308	
soda, uses of	H 356	
substitutes for articles called for by		
receipts	H 354-355	
sun as cook	H 274	
time tables	H 309-310	
warming over food.	H 355	
See also Baking; Boiling; Braising; Bread; Broiling; Cake;		
Canning and preserving; Coffee; Corn; Desserts; Diet; Eggs;		
Electric cooking; Fireless cookers; Fish; Food; Frying;		
Game; Meat; Mushrooms; Oysters; Pastry; Poultry; Rice;		
Roasting; Shell fish; Soups; Stewing; Tea; Traveler's cooker;		
Vegetables		
Coons. See Raccoons		
Copper work		
annealing	M 21	
ash tray	M 85*	
belt buckle	M 88-90*, 195*	
belt pin	D 350*	
bill file	M 124-126*	
book mark	M 128*	
book rack	M 121*, D 351*	
bowls.	M 19-25*	
chalice	M 60*	
loving cup	M 86	
nut set	M 38*	
shaping	M 19*	
box for jewels	M 112-115*	
candlestick	M 47-56*	
drip pan	M 48*	
night candle holder	M 50-52*	
sconce	M 52-56*	
shaping	M 48*	
card tray	D 355-358*	
cedar chest, trimmings	M 115-117*	
chalice	M 60-63*	
cigar box decorations	M 84,* 85	

	PAGE
Copper work— <i>Continued</i>	
coloring	D 357, M 202, 204, 205
corners	D 353*
cutting heavy copper	M 34*
desk set	M 117-129*
draw filing	M 87
enameling on copper	D 354, 355
facets, how made	M 22
filing	M 36-38*
hammering	M 21-23*, 29-30*, 39*
handles	
candlestick	M 49
loving cup	M 87*
making and riveting	M 76-77
making and soldering	M 78-79
hat pin	D 348-50*, M 64-67*
soldering pin to head	M 68*
hat pin holder	M 69-72*
hinges	M 100-106*, 112-115*
ink well holder	M 118-121*
jars	M 56-60*, 82-85*
jewel box	M 107-115*
hinges	M 112-115*
knobs on lids	M 83
lamp, Electric	M 92-96*
lamp shade	
framework	M 96-98*
setting glass	M 98-99*
letter opener	D 347*
letter rack	D 346-347*
lids	
chalice	M 62-63*
ink well holder	M 120*
jewel box	M 111-112*
rose jar	M 59
tobacco jar.	M 83-84*
loving cup	M 86-88*
match safe	M 81-82*
molds for	M 27-28
nut set	M 38-40*
nut spoon	M 39-40*
paper knife	D 347*, M 34-38*, 126*
turned handle	M 127*
patina, imitation	M 202
composition for	M 204
pen tray	M 118-119*
polishing	M 25
rose jar	M 56-60*
Russian coffee pot	M 63*
sawing	M 35-36*
sconce	M 52-56*

	PAGE
Copper work—Continued	
serving tray.	M 75-77*
sheet copper, grades	M 14
smoking set	M 79-86*
soldering	
handles	M 78-79
hat pin	M 68*
spindle	M 124-126*
spoon for nut set	M 39-40*
teapot stand	D 351-353*
tobacco jar	M 82-85*
trays	M 26-33*, 75-77*
ash tray	M 85*
handles, making and riveting	M 76-77
pen tray	M 118*
round	M 26-31*
serving tray	M 75-77*
smoking set	M 80-81*
square	M 31-33*
watch fob	D 353-355*
<i>See also</i> Brass work; Metal work; Silver work; Tools	
Copyright	
application items	B 426
assigning rights	B 425
directions for securing.	B 422-426
duplicate certificates	B 425
fees for recording	B 423
issue of work, not limited	B 425
invalid, when	B 423
labels	B 426
paintings, statues, etc.	B 426
penalties for breaking laws	B 423, 424
projected work	B 425
renewals	B 425
term	B 424
trade marks.	B 426
translation rights	B 424
volumes and variations	B 425
Coral	
how coral is formed	G 216
Coral bells	
characteristics	G 334
Coral fungi	A 86
Coreopsis	
annual	G 322
characteristics	G 329
sowing and blossoming time	G 161
Corn	
contest in growing corn	G 142-150
cooking dried corn	A 428
cultivation of soil	G 144

	PAGE
Corn— <i>Continued</i>	
drying	A 427-428
food value	H 255
husking for cooking	H 294
husks, uses of	A 63
insect pests	G 290
percentage of corn to cob	G 148
points for judging	G 147
planting seeds	
distance to plant	G 42, 144
depth to plant	G 35, 42, 144, 235
quantity to plant	G 36, 144
time to plant	G 234
planting varieties near together	G 145
pollination, how plants are fertilized	G 145
raising on a suburban lot	A 124
seed	
age for planting	G 34
book about	A 518
germination per cent.	G 33, 233
selection	G 142-144, 228, A 410-412*
soil required	G 19, 144
stalk pith, use of	A 63
Corn meal	
food value	H 254
cleansing property	H 332
Corned beef	
food value	H 252
Cornell University	
poultry course	A 173
Cornflower	
biennial	G 332
characteristics	G 330, 332
planting	G 159
self-sowing	G 316
sowing and blossoming time	G 161
Corning, W. O.	
experiment with raising goats	A 116-118
Coronation braid	
how to braid	N 108-111*
Cosmos	
characteristics	G 332
sowing and blossoming time	G 161
Cost of living	
division of income	H 69-86
Cottages	
building and furnishing a simple home	D 366-374*
cost of materials	D 372
Cotyledon	
seed nourishment	G 230

	PAGE
Couch Cover	
weaving design	D 260-262
Couch hammock.	C 478-480*
Couching	
embroidery stitches	N 124*
Counterpane	
making for doll-bed	N 55*
Counting-out rhymes	K 340
Country homes. <i>See</i> Cottages	
Country life	
making the country a better place to live in	A 449-512
<i>See also</i> Camping; Gardening; Sports	
Court, tennis	K 341
Cover for note book	
tooled leather	D 331-336
Cows	
milking	A 245-247
by electricity	E 54
profits in keeping cows	A 243-244
from one cow on a suburban lot	A 123-126
testing for milk supply	A 244
<i>See also</i> Calf; Milk	
Crab (Machine)	B 79*
Crabapple, Wild	
butter or sauce	A 22
regions found	A 21
Crabs	
food value	H 254
cooking soft shell crabs	H 293
opening and cooking hard shells	H 292
Craigin, Belle S.	
Amateur's experience in poultry raising	A 166-168
Cranks (Machinery)	
crank motion	B 312*
mechanism	B 319*
Cream. <i>See</i> Milk and cream	
Cream of tartar	
uses	H 301
Credit. <i>See</i> Accounts .	
Creepers	
insect destroyers	A 456
Creosote	
wood preservative	C 494
Cricket	K 341-343
Crocheting	N 306-319*
abbreviations for stitches	N 306
chain stitch	N 308*
crazy stitch	N 326
cross stitch	N 318*
doll's cap	N 320-321*
doll's hug-me-tight	N 321-323

	PAGE
Crocheting— <i>Continued</i>	
double crochet	N 308*
edging stitch	
loop	N 311*
narrow	N 313*
tiny edging	N 311*
fringe.	N 317
hooks.	N 306-307*
insertion stitch	
cone	N 314*
loop	N 312*
tiny insertion	N 310*
insertion with ribbon	N 315*
jacket	N 323-324*
shell stitch	N 329-332*
patterns	N 320-332*
position of hands	N 307*
rainbow pattern	N 316-317*
scarf, cross stitch	N 318*
shawl, rainbow pattern	N 316-317*
shells	N 310*, 329-332*
single crochet stitch	N 308*, 324*
slip stitch	N 308
slippers	N 324-329*
crazy stitch	N 326*
star stitch	N 326-329*
star stitch	N 324*, 326*
treble crochet	N 309*
washing	N 332*
Crocus	
planting in lawns	A 169, 434
planting tables	G 177, 178
Crops	
succession crops	G 92
<i>See also</i> Gardening	
Croquet	K 343
golf-croquet	K 354
<i>See also</i> Roque	
Cross bow spring	B 266*
Cross stitch	
embroidery stitches	N 103-106*, 107*, 108*
marking towels	N 156
Crosses	
drawing designs	C 25*, 27
Greek, inlay design	C 322
Crowbars	
making	M 352*
Crows	
as pets	K 176
Crucible cast steel. <i>See</i> Steel	

	PAGE
Crum tray and scraper	
brass work	M 135-136*
Crystals, snow	B 367*
Cuckoo	
insect eater	A 456
Cucumber	
food value	H 255
how to peel	H 294
indoor planting time	G 233
insect pests	G 290
origin of	G 303
planting seed	
directions	G 303
time to plant	G 234
seed	
age for planting	G 34
germination per cent.	G 233
thinning plants	G 303
Cucumber vine	
ornamental value	G 359
Cuff links	
metal work	M 192-194*
Cuffs. <i>See</i> Dressmaking	
Cumulus	B 365
Curling (Game)	K 344
Curling iron, Electric	E 116*
Curtains	
dry cleaning	H 332
dusting	H 131
girl's room, furnishings	N 380-381
materials for stenciling	N 81
stencil design	N 75*
stenciling	D 108-117*
stretching	H 328
valance	D 116
washing	H 328-329
weaving, designs and materials	D 262-265
<i>See also</i> Block printing	
Curves	
drawing	B 339*
Cushions. <i>See</i> Pillows	
Cut worms	G 293
detecting and destroying	G 284
toads enemies of	K 168
Cyanide bottle for killing insects	A 379*, K 152
Cypress	
varieties and characteristics	C 540

D

Dado joints	C 236*, 255*
-----------------------	--------------

	PAGE
Daffodil	
narcissus family	G 169
Van Sion variety	G 168
white and yellow, planting table	G 177, 178
Dairy cow. <i>See</i> Cows	
Dairy Products	
food value	H 254
<i>See also</i> Butter; Milk	
Dairying	
book about	A 517
keeping accounts	A 241-242
sanitary milk pail	A 246*
Daisy	
characteristics of the English daisy.	G 334
class and seed time of ox-eyed and yellow	G 278
embroidery stitches	N 177-179*
Dampers	
in pipes and ovens	H 229
principle of stoves and ranges	H 227-230
Dams	
famous dams of concrete	B 246-247
Dandelion	
class and seed time	G 278
greens	A 63
Daphne	
characteristics	G 355
Darning	
Limerick darning, lace stitches	N 234
stockings.	N 9-11*
Dates	
food value	H 255
Day and night	
cause of	B 213
Debit. <i>See</i> Accounts	
Decanter	
washing	H 183
Decoration and ornament	
woods suitable for	C 240
<i>See also</i> Block printing; Carving; Embroidery; Enamel and enameling; Floral decoration; House decoration; Leather work; Metal work; Pottery; Pyrography; Stenciling; Wood carving	
Decoration, interior. <i>See</i> House decoration	
Deer	
book about	A 518
Design. <i>See</i> Architecture; Basket making; Bead work; Brass work; Copper work; Embroidery; Furniture; House decoration; Leather work; Metal work; Pottery; Silver work; Stenciling; Wood carving	

PAGE

Desk, library desk	
design	D 47*
design and construction	D 184-187*
wood finish	D 237
mission style writing desk, design	C 375*
writing desk, design	D 50*
Desk pad	
copper fittings, making	M 122-124*
leather, design and making	D 335-338*
Desk sets	
copper	M 117-129*
pen and ink trays, gouge work	C 258-264*
Dessert	
combinations for food value	H 259
Deutzia	
characteristics	G 256
Devil's snuff box	A 87
Dibber	G 47*
Dies (Metal work)	
making	M 206-208
Diet	
carbohydrates	H 248-252, 277
chemical properties	H 249
giving undue concern to	H 244-247
ideal, objection to	H 261
principles of	H 246-263
proteins	H 248-252, 277
<i>See also Food</i>	
Digestion. <i>See Diet</i>	
Digitalis	
made from foxglove	A 57
Dining-room	H 160-187
care of	H 51, 160-171
furniture	
arrangement	D 61
design	D 53-57*
ideal	H 187
plan in the model house	D 9
work, setting and serving the table	H 160-171
Dirigible balloons	B 162
Dish washing	
cloths, care of	H 184
decanters and bottles	H 183
egg stains, removing	H 183
glasses	H 180
preparation of dishes	H 179
process	H 179-185
rinsing dishes	H 182
silver	H 181
steel knives	H 184
wiping and putting away	H 52, 182-184

	PAGE
Dish washing— <i>Continued</i>	
without running water	H 178
Disinfectants	
use in plumbing	H 218
Ditch drains. <i>See</i> Drainage	
Dividers (Tools)	
forging	M 340-341*
using in metal working	M 5*, 24*
Diving.	K 238*
girls as divers	K 320
Dixie's land (Game)	K 345
Dock, yellow	
class and seed time	G 278
Dogs	
as friends	K 187
bathing	K 188
boarding dogs as a business	A 237-238
profits from	A 239
breeds	K 187-188
farm dogs	A 106
feeding	A 238, K 188
puppies	A 224
fleas	K 188, 189
house, working drawing of a toy house	C 42*
housing	K 188
punishing	K 189
raising	A 223-226
story of success in	A 235-240
selecting a pet	K 187-188
training	A 249-252, K 189-192
for cattle herding	A 250, 251
for hunting	K 190-192
for retrieving	A 250
for running machinery	A 255-256
Dog's tooth violet	
characteristics	G 342
Dogwood	
characteristics	C 563, G 356
Doilies	
Irish crochet edge	N 335*
Doll's clothes	
cap	
crocheted	N 320-321*
knitted	N 362*
cape, knitted	N 360*
hug-me-tight, crocheted	N 321-323*
jacket, knitted	N 360-362
leggings, knitted	N 363*
<i>See also</i> Dressmaking; Sewing	
Doll's furniture	
bed fittings	N 50-56*

	PAGE
Doll's Furniture— <i>Continued</i>	
cigar box trunk	H 12
pasteboard box for bed	H 11, 12
Domestic Animals	
books about.	A 517
raising	A 100-202
for pets.	A 203-240
<i>See also</i> Cat; Cow; Dog; Horse; Pigeon; Poultry; Sheep;	
Swine	
Domestic Economy. <i>See</i> Housekeeping	
Door handles	
metal work	M 406, 407, 416*
Door hasp	
forging	M 338-340*
Door knockers	
escutcheon plate	M 410,* 412-414
iron metal work	M 410-415*
Door pulls	
metal work	M 415*
Doors	
batten door	C 448*
electric door opener	E 55*
frames, setting	C 469
hanging	C 474
inside trim	C 473*
paneled	C 354-355, 528-530*
saddles	C 474
Dough. <i>See</i> Bread; Pastry	
Dovetail joints	C 253*, 256*, 313-314*
Dowel bit.	C 194
Dowel for weaving	N 297
Dowel joints	C 251*
Doweling	D 134
Dracenas	
window box plant	G 193
Drafting. <i>See</i> Mechanical drawing	
Dragon-flies	
habits	A 388
Drainage	
ditch building	G 123
grading and digging	G 114
pipe, depth laid	G 111
problem for garden plot	G 110-122
"sighting" for drop and bed level	G 112-114
sloping land.	G 17
standing water	G 21
stones for trough, setting.	G 116
tiles, laying	G 115
types of drains	G 22
wooden troughs, disadvantage of	G 115
Drainage, House. <i>See</i> Plumbing; Refrigerator	

	PAGE
Draught	
of open fires	H 224
principle of stoves and ranges	H 227-230
Draw knife	C 216*
Draw plate	
definition of	M 209
Drawer pulls	
metal work	M 417-419*
Drawing	
designing a corner for stencil work	D 111
designs for block printing	D 100-101*
how to enlarge or reduce a drawing	C 390, B 339
outline drawing for stencil work	D 112
<i>See also</i> Mechanical drawing	
Drawing board	
making	C 24*, 381-383*
Drawing instruments	
making a box for	C 240*
making a mechanical drawing outfit	C 381-398
Drawnwork	N 207-226*
all-over	N 213-220*
Bulgarian weaving patterns.	N 222-226*
butterfly pattern	N 220-222*
convent work	N 213-216*
daisy pattern	N 219*
feather stitch	N 212*
filling spaces	N 219
frames for	N 222
handkerchiefs	N 213-219*
maltese cross	N 219
Mexican	N 211*
sheaf stitch	N 211*
soaping threads.	N 213
twist stitch	N 212*
<i>See also</i> Fagotting; Hardanger embroidery; Hemstitching	
Dress. <i>See</i> Clothing and dress	
Dresser. <i>See</i> Bureau	
Dressmaking	
bands, cutting	N 64
bias bands, cutting	N 65
box plaits	N 71
collars	
cutting	N 64
fastening to waist	N 70
cuffs	
cutting	N 64
sewing on sleeves	N 68
cutting from a pattern	N 63-67*
frills, cutting	N 64
patterns	
allowing for seams	N 65

	PAGE
Dressmaking patterns — <i>Continued</i>	
cutting doll's skirt from	N 42*
cutting from	N 63-67
drawing and cutting	N 41*
notches and perforations	N 66
pinning material on	N 66-67*
plaiting skirt	N 71-72*
seams, tailored	N 72
skirts	
bands	N 39*, 44
basting seams	N 42
cutting from a pattern	N 42, 63-64*
hemming	N 36, 43
plackets and gussets	N 35-40*, 43
plaiting	N 71-72*
putting on the bands	N 44
sleeves	
cutting	N 64
gathering	N 69*
putting into waist	N 70*
putting together	N 68*
waists	
cutting	N 64
cutting from pattern	N 67*
joining seams	N 69
<i>See also Sewing</i>	
Driftwood	
gathering	A 405
Drilling and boring tools	
draw boring	C 415*
drills for copper and silver	M 9*
forging and tempering rock drills	M 344-349*
forging hand drills	M 347-349*
kinds and their uses	C 193-198*
Driveways of ashes	G 77
Drowning	
method of rescue from	K 239
Dry cleaning	
delicate and light-colored articles	H 332
Duck on a rock (Game)	K 345
Ducks	
book about	A 517
brooders	A 193
characteristics	A 192
feeding ducklings	A 192
how to select for cooking	H 271
marketing	A 191
raising	A 190-193
ducks versus chickens	A 191-192
story of a boy's animal cage	A 235
varieties	K 181

	PAGE
Ducks— <i>Continued</i>	
water not essential for raising	A 190-191
wood ducks, domesticating	A 462*
Duplicating machine	B 416
Dusting	
bedroom	H 53
floors	H 125
house cleaning process	H 145
little services	H 51
opening the house	H 352
Dutch collar	
Irish crochet	N 346-350*
Dutch oven	K 81
Dyeing	
colors, how to obtain	D 278-279
hints	D 277-278
lace	N 238
Dynamometer	B 324*
Dynamos	E 3-9
alternating current.	E 21-24
batteries replaced by	E 249-250
construction of a simple dynamo	E 222-225*
definition of.	E 19
efficiency.	E 5-6
field	E 9, 11-13
generating electricity	E 9-10
how a dynamo generates both direct and alternating currents	E 222
how used as a motor	E 45-48
installing.	E 225
load	E 105
magneto	E 19-24*
illustration of use.	E 21-23
rate of vibration	E 22-23
use for ringing telephone bells	E 287-290*
principle of a simple dynamo	E 11-13*
producing tones with	E 293-295
series wound	E 34*
shunt wound	E 34*
transmitters not power producers	E 7
<i>See also</i> Armatures	

E

Earth	
attraction exerted by sun and moon	B 229-230
diameter	B 213
distance from sun and moon	B 229-230
elements	B 214
globular form proved	B 212-213*
rotation	B 213, 214
Eddy kites	
making	C 86*
Edging. <i>See</i> Crocheting; Irish crochet	

	PAGE
Edison, Thomas A.	
discovery of carbon filaments	E 134
new storage battery	E 262-263
Eggplant	
cooking preparation	H 294
parasites on	G 304
planting seed	G 304
indoor planting time	G 233
time to plant	G 234
seed, germination per cent.	G 233
soil for	G 304
transplanting	G 304
Eggs	
cooking, preparation for	H 288
ducks' eggs	A 192
fancy breed eggs	A 221
food value	H 254
gold fish eggs	A 229
Guinea fowl, value of	A 179
insect eggs	A 393
judging freshness of	H 271
marketing	A 158
pheasant eggs, packing	A 199
preserving	
for winter use	A 177-178
yolks in water	H 357
record for laying hens	A 157
selecting for sitting hens	A 148
separating yolks from whites	H 288
stains	
removing	H 183
<i>See also</i> Poultry	
Egyptian Pyramids	B 54-56
Elderberries	
canning, receipt	A 16
picking	A 15
steam pudding, receipt	A 16
Electric annunciators	
construction and operation	E 68-71*
Electric apparatus and appliances	
using electricity to aid the memory	E 301-304
<i>See also</i> Armatures; Clocks; Dynamos; Telegraph; Telephone;	
Vacuum cleaners; and words beginning Electric	
Electric armatures. <i>See</i> Armatures	
Electric batteries	
cells, positive and negative plates	E 256, 261
dry cells	
cost	E 166
increase of voltage by increased resistance	E 194-198
structure	E 250-251
use for lighting a summer camp	E 162-167*

	PAGE
Electric batteries— <i>Continued</i>	
electrolytic cells	E 257-260
galvanic cells	
depolarizing agent	E 256
effect of heat on chemical action	E 254
electricity produced by chemical action	E 251
polarization of	E 256-257
replaced by dynamos	E 249-250
simple cell, chemical action	E 254-256
sparking apparatus for a gasoline engine	E 178-203*
storage batteries	E 258-263
Edison battery, construction and care	E 262-263
lead, construction and care of	E 261-262
why they run down	E 192-194
Electric bells	
alternating current bells	E 288
equipment and installation in a house	E 296-299
operated by induced current	E 350-352
operated by wireless outfit	E 324*
operation of electric bells and buzzers	E 72-75*
transmitter in wireless telegraph	E 321
Electric buzzer	
operation	E 72-73*
used in electric organ	E 278-279
Electric cars	
electric heaters	E 125
<i>See also</i> Electric railroads	
Electric central station	E 204-217*
Electric cigar lighter	E 115*
Electric circuit breakers	E 78*
Electric circuits	
open and closed	E 73
Electric clocks. <i>See</i> Clocks	
Electric conductors	
copper sulphate	E 259
copper versus iron	E 64
effect of impurities in water	E 64
salt solution	E 253, 265
water	E 200
Electric controllers	
arc lamp feed	E 84
automatic	
air control	E 53
principle of	E 49-53*
elevator switches	E 83
principle of	E 17
<i>See also</i> Electric rheostat	
Electric cooking	
broilers	E 114*
chafing dish	E 113*
coffee percolator	E 113*

PAGE

Electric cooking—*Continued*

fireless cooker	E 128-132*, 308
hot plate	E 110-113*
oven	E 114, 305-308*
toaster	E 115
traveler's cooker	E 113*
with incandescent lamps	E 127*
Electric curling iron	E 116*
Electric currents	
alternating	
definition	E 31
for telephone bells	E 288
generation of	E 11
how produced	E 21-24
changing alternating to direct currents	E 238-239
chemical reaction produced by powerful currents	E 263-264
decomposition of water	E 264
different currents pass through the same wire	E 187
direct, definition of	E 31
induced current	
by interrupting the circuit	E 184
by moving the magnet	E 17-18
direction of	E 186
experiments	E 349-352
magnetic field about	E 353*
primary and secondary, in spark coils	E 184-192*
produced by chemical action	E 251-263
rectifiers	E 238-239
secondary, voltage	E 189-190
telephone	E 287
Electric engine	
principle of a toy engine	E 58*
Electric flash light	E 154-155*
Electric flasher	E 120-125*
Electric fuses	E 117*
"blowing"	E 146, 292
Electric gas lighter	E 118-120*
Electric generators. <i>See</i> Dynamos	
Electric heating	
apartments	E 125
applications	E 107-159
bedroom heater.	E 126*
cars	E 125
hot plates versus incandescent lamps	E 131
pad	E 117
principle of	E 97-106*
<i>See also</i> Electric cooking	
Electric hot plate	E 110-113*
Electric incubator	E 114
Electric induction coil	
illustration	E 96*

	PAGE
Electric insulators and insulation.	E 14
glass knobs for telephone wires	E 290
Electric iron	E 243*
principle and cost of using	E 107-110
Electric lamps, Arc	
arc lamp feed	E 84
carbons, adjustment	E 150-152*
glass globes, economy of	E 150-152
mechanism	E 147-150
mercury vapor lamp	E 155-156*
Moore light	E 156
search light	E 153*
stereopticon	E 153*
Electric lamps, incandescent	
burglar's flash light	E 154-155*
connecting lamps with the circuit	E 142*
construction	E 142-143*
cooking with	E 127*
current required	E 30
filament	
carbon	E 134-135
life of	E 144-145
making of	E 142
testing	E 141
development of	E 132-135*
metal	E 145-146
platinum wire	E 133
sizes, measuring	E 134
hylo, use and cost of	E 138*
intensity, comparison of	E 137-141
Nernst lamps	E 157
numbers manufactured	E 134
operating by induced currents	E 349-352*
operating by wireless outfit	E 327
resistance	E 29
of lamps in parallel	E 123*
socket	E 143*
tungsten lamp	E 141*, 144, 145
Electric light	
percentage of waste in producing	E 150
search light	E 153*
Electric light fixtures	
copper lamp	M 92-96*
design	D 361-364*
Electric lighting	
cost	E 41, 139-141, 144
fitting up a summer camp	E 160-167
growth of demand for	E 134
Electric measurements	
units	E 37-42*
ampere	E 30

	PAGE
Electric measurements, units— <i>Continued</i>	
kilowatt hour	E 41
volt	E 39
watt.	E 39
Electric meters	
care when closing house	H 351
reading	H 239
<i>See also</i> Ammeter; Voltmeter; Wattmeter	
Electric milking machine	E 54
Electric motors	E 43-56
acting as dynamo	E 36
compared with dynamo	E 47-48*
E. M. F. in motors	E 48
<i>See also</i> Electric controller	
Electric organs	E 55, 278-279*, 293-295
pipe organ	E 44-52
Electric oven.	E 114
automatic control of temperature	E 306-308*
brick, construction	E 305-308
Electric potential	
meaning of difference in potential	E 200-202
Electric power	
conversion of steam into electric energy	E 4
cost in large and small plants	E 204
production of	E 3-10
Electric power distribution	
cost	E 210
distances, power and cost	E 210-211
loss in transmission	E 210, 216
voltage in relation to distances	E 211
Electric power plants	
central stations	E 204-205*
equipping an amateur plant	E 220-239
estimating the capacity	E 219
number and annual output in the United States	E 205
water power for	E 202-217
Electric pumps	
use of	E 51-54
Electric push buttons	E 74-75*
for elevators	E 69-70*
house bells	E 297-299
Electric railroads	
current controller, principle of	E 53
toy operated by wireless outfit	E 325-327*
what moves the cars	E 16
Electric resistance	
impedance	E 285-286
laws for wires	E 120
of electric lamps	E 29
of lamps in parallel	E 123*
ohmic resistance	E 285

	PAGE
Electric resistance— <i>Continued</i>	
principle of electric heating and lighting	E 100-106
resistance board	E 30
starting box.	E 48, 81-83*
telephone circuit	E 285-287
unit, ohm	E 91-93
variation of heat with resistance	E 291
wires, diameters and resistance	E 136
Electric rheostats	E 47-49*
<i>See also</i> Electric controller	
Electric seal	A 491
Electric shock	
conditions necessary	E 170
electric waves	E 315
experiments with spark coil	E 196, 198-201, 180-183*
how it feels	E 170-177
Electric shower bath	
constructing	E 244-247*
Electric soldering iron	E 116
Electric spark coil	
automobile spark coil	E 95*
gasolene engine equipment	E 178-203*
how voltage is raised by the spark coil	E 180-183
jump spark coils	E 184
make and break coils	E 183
primary and secondary	E 188-192
principle	E 180-187*
telephone	E 279-281*
vibrator	E 190
voltage	E 191
wireless telegraph	E 321-322*
with two windings	E 187-191*
Electric spinner	E 57*
Electric switches.	E 74-75*
circuit breakers.	E 78*
double-pole, single throw	E 52*
Electric thermostat	E 124
for brick oven	E 306-308*
Electric toys	
engine	E 58*
spinner	E 57*
train operated by wireless	E 325-327
Electric transformer	
construction	E 212-216*
illustration	E 96*
magnetic circuit	E 214*
relation of voltage to windings	E 215
step-up and step-down transformer	E 216
Electric washing machine	
construction and use	E 241-243*
Electric waves	E 309-323

Electric waves— <i>Continued</i>	
changes in length	E 316
Hertzian waves	E 346
Electric welding	E 158-159
Electric wires	
diameters	E 135-137
glass knobs for insulating	E 290
ground wire for wireless telegraph	E 321
resistance	
laws of	E 120
tables	E 135-137
Electric wiring	
use of earth circuit	E 290-291
Electricity	
Ampere's rule	E 30-32
chemical transformer	E 256
doing chores with	E 241-243*
E. M. F., meaning	E 203
electrical current compared with	
water current	E 176, 197-198, 201
every-day uses, list	E 219
galvanic	E 248
how electricity feels	E 170, 177
medical use	E 175
Ohm's law	E 92-93
<i>See also</i> Induction (Electricity); Telegraph; Telephone; Wire-	
less telegraph; also headings beginning Electric and Electro	
Electrocution	E 175-176
of rats	E 271-273*
Electrolysis	
of solutions	E 257-261
of water	E 264-266
Electrolyte	E 256
Electrolytic actions in every-day life	E 266-270
Electrolytic cell	E 257-260
Electromagnet	E 11-24
applications of	E 54-96*
arc lamp control	E 148
construction	E 15*
discovery of	E 14, 17
lifting power	E 15-16, 79-81
magnetic intensity	E 16
principle of	E 14-15
strength compared to bar magnets	E 16
use in relay	E 322
Electrometallurgy	
separating iron from ore	E 79*
Electromotive force	
counter electromotive force in motors	E 48*
Electroplating	E 259-261
Elevators	
electric controllers, operation of	E 83

	PAGE
Elevators— <i>Continued</i>	
how annunciators are operated	E68-71*
Elijah and the widow's cruse of oil	H 32
Ellipse, drawing	B 210-211*, C 19*
string and pin method	C 112*
trammel method	C 113*
Elm	
red or slippery elm	C 558
rock or cork elm	C 560
white or American	C 559
Embankments	
retaining wall for riverside	B 238-245
wall for lawn	G 74
Emblems	
bullion embroidery	N 155
Embossing iron	M 361
Embroidery	N 98-241*
bars, twisted and woven	N 141*
blanket stitch	N 142*
bullion stitch	N 165-166*
bullion work	N 154-156
butterfly pattern, drawnwork	N 220-222*
buttonhole and satin stitch design	N 166*
buttonholing	N 130-134*, 142-145*
card case	N 183-186*
cat stitch	N 102, 215*
chain stitch	N 99-100*
cleaning	
washing	H 329, N 136-137
without washing	N 379
collars, Hedebo embroidery	N 203*
combination stitch	N 148-154*
combinations of colors and stitches	D 118-119
compass design	N 167-168
couching stitch	N 124*
cross stitch	N 103-106*, 107*, 108*
daisies	N 167, 177-180*
designs, planning	D 118
drawnwork	N 211-226*
eyelet work	N 160-163*
fagotting	N 145-146*, 229*
feather-stitching	N 116-118*
flower work	N 176-189*
colors	N 176
shading	N 179-180
stems	N 180
French knots	N 164-165*
Hardanger	N 190-197*
Hedebo embroidery	
bars	N 204*
circles	N 204-206*

	PAGE
Embroidery, Hedebo— <i>Continued</i>	
materials for	N 202
triangles	N 204*
hemstitching	N 207-210*, 215*
herring-bone stitch	N 101*
honeycomb stitch	N 144*
hoops.	N 122-123
ismet stitch	N 125*
Kensington stitch	N 178-179*
lace, embroidering on	N 180
ladder stitch	N 158-159*
lazy-daisy stitch	N 119-120*
leaves, shading	N 179
letters	N 147-154*
lingerie hats.	N 171-174
long and short stitch	N 177*
monograms	N 152-154*
needles	N 121
outline stitch	
combination stitches	N 148-154*
rough and smooth	N 101*
padding	N 99, 130-131, 147-148, 156
picots	N 192*, 194*
pin cushion top	N 193-196*
pyramid stitch, Hardanger	N 195*
ribbon work.	N 181-189*
card case	N 183-186*
rococo	N 181-189*
Roman cut work	N 138-142*
satin stitch	N 147-149*, D 119
design	N 158*
scalloping	N 132-133
drawing scallops	N 135
seeding	N 154*
shadow embroidery	N 125-128*
silks, when not to use	N 157
skeleton stitch	N 381
smocking	N 112-114*
spider stitch	N 142
stamping patterns	N 128-129
star patterns, Hardanger	N 191*
stem stitch	N 154
substitute for	N 379*
suggestions for a girl's room.	N 372-381
threading the needle	N 103
tools	N 121-123
Turkish stitch	N 125*
Van Dyke stitch	N 151*
Wallachian embroidery	N 134-137*
Emergencies, housekeeping	H 353-369
Enamel and enameling	M 197-211

	PAGE
Enamel and Enameling— <i>Continued</i>	
backing	M 208
basse-taille	M 208
black spots, removing	M 201
champleve method	M 202, 208
characteristics of enamel	M 197
cloisonne	M 201, 209
finishing	M 201
firing process	M 199-201
muffle furnace for	M 199
on copper	D 354-355
on silver	D 355
placing enamel on metal	M 198
polishing	M 205
preparing enamel	M 197
tools	M 197
unsoldering	M 205
<i>See also</i> Wood finishing	
Enamel ware	
kitchen utensils.	H 201
Endive	
blanching	G 305
planting and transplanting	G 305
seed, time to plant	G 234
winter culture	G 305
Engineering. <i>See</i> Mechanics	
Engines	
external and internal combustion	B 121-122, 128-130* 387
oscillating	B 333-334*
parallel motion, mechanism	B 332-333*
speed regulator	B 328*
steam versus gas or oil, advantages	B 121
<i>See also</i> Electric engines; Electric motors; Gasolene motors;	
Horse power; Steam engines; Turbines	
English bind weed (Morning glory)	
class and seed time	G 278
Engraving	
cement	M 205
iron work	M 361
Ensigns, code	B 108, 109
Entomology. <i>See</i> Insects	
Envelope for clippings	
making	N 187-189*
Equestrian polo	K 377
Ermine	A 495
Escallops. <i>See</i> Scallops	
Escutcheon plates	M 410,* 412-414
Etching	
iron work	M 362
Ether (of space)	
chemical waves, effect of	E 336

	PAGE
Ether (of space)— <i>Continued</i>	
development of the universal ether idea	E 339-348
kinds of ether waves	E 310-316
medium for transmitting wave motions	E 343
original meaning	E 344
wave theory, exponents of	E 344-346
waves sent forth by Halley's comet	E 333-338
Evergreens	C 535-542
for hedge	G 82
landscape gardening	G 354
southern smilax	A 54
<i>See also</i> Pine	
Exercise	
value of	K 10-13
walking	K 14-17
Exhibits, vegetables and flowers	G 201-208
flowers, arrangement	G 205
labeling	G 205
vegetables	
arrangement	G 202, 204
preparation of	G 202
Eyelet work	
designs for	N 163*, 164*, 167-168
edges of	N 169
lingerie hat	N 169*
making eyelets	N 161-162*
padded eyelets	N 162*
Eyes and hooks	
sewing on	N 24-25*
F	
Face plate	
definition of	M 209
agots	
collecting	A 406
Fagotting	
lace stitches	N 229*
Bermuda fagotting stitch	N 145-146*
Fahrenheit scale	B 261
Fancy work. <i>See</i> Applique; Basket making; Bead work; Braiding; Crocheting; Embroidery; Hemstitching; Knitting; Lace mak- ing; Needle work; also names of articles, e. g., Pin case; Sewing apron, etc.	
Faraday, Michael	
discovery of magneto-induction	E 14, 17
theory of ether phenomena	E 345
Farm machines	
dog power for running	A 255
Farmers' bulletins	
how to secure	A 513

	PAGE
Farming. <i>See</i> Dairying; Domestic animals; Drainage; Fertilizers and manures; Flower gardening; Forestry; Fruit: Gardening; Irrigation; Soils; Trees; Vegetable gardening; Vegetables	
Fashion. <i>See</i> Clothing and dress	
Fat (Game)	K 346
Fats	
food composition and value	H 249, 250
frying fats	H 282
proportion in diet	H 249, 252
Feather race	K 347
Feather-stitching	
decorations in	N 119
double stitch	N 117*
marking with	N 156
seaweed stitch	N 118*
single stitch	N 116*
threads	N 118*
Feathers	
goose	A 189-190
poultry	A 159
Feed rolls	
mechanism	B 316*
Fences. <i>See</i> Hedges	
Fermentation	
principle of	A 414
Fern dish	
making pottery	D 310-313*
Ferns	
care of, in house	G 197
gathering	A 55, 359
varieties to grow	G 198
Fertilization of plants	G 246-248
Fertilizers and manures	
amount required for poor soil	G 18
hen manure	A 143
leaf mold, making	A 421-424
preparing manure for hotbeds	G 108
sod for compost	G 262
source of nitrogen	G 223
wood ashes	A 433
for strawberries	G 94
<i>See also</i> Humus; Lime; Nitrates; Phosphates; Potash	
Field athletics. <i>See</i> Track athletics	
Field, Cyrus, W.	
and the Atlantic cable	E 65
Figs	
food value	H 255
Files and rasps	C 204
draw filing in copper work	M 37
metal work	M 9*

	PAGE
Filing cabinet	
construction	C 358-359*
drawer designs to represent books	C 397*
for drawings, making	C 395-396
Filling. <i>See</i> Wood finishing	
Finance. <i>See</i> Accounts; Allowances; Housekeeping; Income	
Finger bowls	
brass work	M 133-135*
use of	H 172
Finishing. <i>See</i> Wood finishing	
Fir. <i>See</i> Balsam	
Fire	
mystery of flame	H 226
Fire extinction	
burning grease	H 236
chimneys	H 234
Fire making	
camp fires	K 67-69
for cooking	K 77-82*
coal fire	H 227-233
daily care	H 232
laying and lighting	H 231
furnace fires.	H 233
lighting a fire with kerosene	H 231
open wood fires	H 223-227
<i>See also</i> Ranges	
Fire of coal: story	H 37
Fire screen for metal work	M 11*
Fire tools	
making	M 370-379*
poker, forging	M 371*
shovel, forging	M 372*
stand for, making	M 377-379
tongs, making	M 374-377*
riveting	M 376
<i>See also</i> Andirons	
Firearms	
shot guns versus rifles for boys	K 112
use of	K 110-124*
Fireless cookers	
electric	E 128-132*, 308
Fireplaces	
camp fireplaces	K 78-79
hearth, flue and draught	H 223-224
made of field rock	D 371*
tiles, making	D 318-320
<i>See also</i> Andirons; Fire tools	
Fires	
damage from	C 513
danger from oily cloths	H 12
preventing forest fires	A 467-468

	PAGE
Fireworks	
operated by wireless outfit	E 327-328*
Firing pottery	D 299-301*
Fish	
boiling	H 290
whole	H 278
broiling	H 275-276
cleaning	H 289
to preserve heads and tails	H 290
food value	H 250, 253
combined with vegetables	H 259
frying	K 91
how to select for cooking	H 271
pan fish, meaning	K 130
protecting from natural enemies	A 273
taming	A 266
<i>See also</i> Brook trout; Gold fish; Shell fish; Trout	
Fish spears	
forging	M 240*
Fishing	K 125-143*
bait	K 130-136*
bait casting	K 137-138
boats	K 140
fly casting	K 130, 134-137*
gaff	K 141
game fish	K 126
hooks.	K 128-129*
landing nets.	K 141*
line winder, whittling	C 15*
lines, selection and care	K 128, 135
methods	K 129
qualifications of a successful fisherman	K 125
reels	K 127
rods, selecting	K 127
rules	K 142
still fishing	K 129, 139-140
tackle	K 126-129*
time to fish	K 141
trolling	K 133*, 139*
Fixtures. <i>See</i> Electric light fixtures	
Flag (Plant)	
characteristics of dwarf flag	G 334
Flags	
yacht signal code	B 107-109
Flannels	
washing	H 324, 328
Flash light	
burglar's	E 154-155*
Flat irons. <i>See</i> Electric iron	
Fleece. <i>See</i> Goats; Sheep	
Flemish oak stain	D 231

	PAGE
Fletcher, Horace	
theory of food chewing	K 10
Fleur-de-lis. <i>See</i> Iris	
Flicker	
bird house for	C 219
Flies	
book about	A 519
breeding places	A 476-477
danger to health	A 475
development from the egg	A 393-395
exterminating	A 475-478
Floating heart	
characteristics	G 366
Floors	
building	
estimating lumber for octagon or hexagon	C 507-509
for model house	D 28
for summer house	C 417
laying floors	C 471
setting beams	C 470
carpets versus rugs for	H 125
cement floors for poultry house	A 137
color scheme in house decoration	D 16
cleaning appliances	H 142
dusting	H 125
finish for wood floor	H 192
kitchen floors and floor coverings	H 191
polishing	H 126
refinishing	H 127
waxed floors, polishing	H 126
<i>See also</i> Carpets; Matting; Rugs; Strength of materials;	
Vacuum cleaner	
Floral decoration	
backgrounds	D 89-90
color scheme	D 84-86
combinations	D 83
dining table	D 91-92
garden method	D 83
grouping	D 82
holders and vases	D 86-89*
Japanese idea	D 81
principles of arrangement	D 93-94
wild flowers, decorative value	A 56
Flour	
cleansing qualities	H 332
food value	H 254
Flower basket	
weaving	G 61-64*
Flower embroidery. <i>See</i> Embroidery	
Flower gardening	G 315-335
annuals	G 328-331

	PAGE
Flower gardening, annuals— <i>Continued</i>	
blooming after frost	G 330
arrangement of plants	G 317
background plants	G 317, 320, 321
bedding plants	G 323
biennials	G 322
border plants	G 137, 321
climbing annuals: table	G 331
color scheme	G 315, 361
cut flowers: tables	G 329, 333
drills, making	G 156
establishing a nursery business in California	A 94-99
formal garden	
border	G 152
color scheme	G 154
diagram of	G 153
gradation of plants	G 151, 152
staking plots and paths	G 154, 155
straight lines in	G 357
fragrant flowers: tables	G 330, 333
girls' work	G 151-164
hardy and self-sowing plants	G 316-321
house plants	G 196-198, H 139
informal gardens	G 358
insect pests	G 199, 293
location of garden	G 361
perennials	G 333-335
potted plants	G 180-200
drainage	G 172, 183-185
pests, remedy	G 199
pots, cleaning	G 184
potting process	G 186-187
soil	G 171, 183-185
transplanting	G 181-182
watering	G 199
profit in	
selling flowers	G 373
selling seeds	G 371-372
selling young plants	G 370-371
rock garden	G 324-326
round beds, making	G 136-137
school grounds	G 82-84
screening unsightly places	G 362
selection of flowers for landscape effect	G 361
self-sowing annuals: table	G 331
shady places, annuals for: table	G 331
slipping plants	G 188-190
soil, annuals that suit heavy or sandy soils	G 328-329
succession in bloom by months	G 316, 364
time table	G 161
topping plants	G 199

PAGE

Flower gardening—*Continued*

See also Bulbs; Gardening; Vines; Wild flower gardening;
Window boxes; also names of special flowers, e. g., Chrysanthemum; Larkspur; Pansy

Flower missions A 62

Flowers

collections, labeling K 156

preparation and mounting K 155

cut flowers

annuals for G 329, 333

care of H 160

honey or pollen producing A 322

jardiniere for, making G 66-68*

pistils and stamens G 246-247

propagating wild flowers A 467

protecting wild flowers A 465-467

supplying city children with wild flowers A 61

water and bog plants G 366

See also Floral decoration; Flower gardening; Plants; Wild
flower gardening; Window box; also names of special flowers,
e. g., Lily

Flues

cleaning H 234

purpose of H 224

See also Chimney

Flux

definition of M 209

iron and steel M 221

use of, in welding M 247

Fly casting K 134-137*

Flying

theory of B 195-197

Flying machines

glider. B 179

heavier than air and lighter than air types B 162-163

See also Aeroplanes; Balloons

Fobs. *See* Watch fobs

Foliage plants G 324

Follow the leader (stump master) K 387

Food

ash, meaning of H 249

carbohydrates H 248

combinations H 257-261

condensed, harmful H 261

fats H 249

non-nourishing, value of H 260

pre-digested, harmful H 261

proportion of income to be used for food H 74, 78

protein H 248

refuse, meaning. H 248

values H 247-257

Food—*Continued*

experiments of United States Government	H 250
variety essential	H 249, 262
<i>See also</i> Cookery; Diet; Fish; Fruit; Marketing; Meat; Vegetables; also names of special foods, e. g., Bread; Macaroni, etc.	
Football	K 267-283*, 348-350
association or soccer	K 269, 331
captain	K 273
centre rush, qualifications	K 270, 272
dangers of the game	K 267
"down"	K 275, 281, 349
drop kick	K 272, 349
ends, qualifications	K 270, 273
field goal	K 276, 349
full-back, qualifications	K 272, 273
goals, choosing	K 276
gridiron	K 273*, 274, 348
half-back, qualifications	K 271, 273
kicking off	K 276, 281
line-up diagram	K 268, 270*
players, weight and size	K 270
playing the game	K 274-276, 348
positions of players	K 269, 349
punt	K 349
quarter-back, qualifications	K 270, 273
Rugby	K 269
rules	K 280-283
rushing the ball	K 275
"safety"	K 282
scores	K 276, 281-282, 348
scrimmage	K 281
season	K 267
shoes	K 280*
signals	K 277-279
tackles, qualifications	K 270, 273
team, organization	K 269-273
team work	K 273-274
touchdown	K 275, 349
training	K 283
uniform	K 279-280*, 350
Foot bridge. <i>See</i> Bridge building	
Foot pound	B 123
Foot stools	
designs and construction	C 291-300*
mission style, design	C 374-375*
Forest fires	
damage from	C 513
preventing	A 466-468
Forestry	
book about	A 516

	PAGE
Forestry— <i>Continued</i>	
conservation.	C 519
value of forests.	C 514-516
waste timber problems	A 406
<i>See also</i> Lumber and lumbering; Trees; Wood lots	
Forge	
bellows	M 216*
building fire in	M 217-218
construction	M 216
draught systems	M 227-229
explosion, danger of	M 229
portable forge	M 222-223*
draught system	M 223
tuyere	M 216
Forget-me-not	
characteristics	G 365, 366
Forging	
bending	M 236
bending corner in iron	M 271-273*
bolts	M 240-244*
butcher knife	M 354-357*
crow bar.	M 352*
dividers, pair of	M 340-341*
door hasp	M 338-340*
eccentric strap	M 334*
fish-spear	M 240*
fork, two pronged	M 239*
garden hoe	M 335-337*
gate hooks	M 236-238*
grub hoe.	M 328-330*
hand drills	M 347-349*
hand hammers	M 316-322*
harness hooks	M 238*
heating steel	M 290
hinge and butt	M 283-285*
ice-shaver	M 327*
nail puller or claw tool	M 353*
nuts	M 244-246*
oxidizing fire	M 233
pipe method	M 333
pitchfork	M 239*
punching holes	M 245*
reducing fire	M 233
rock drills	M 344-349*
shackles	M 349-352*
sockets for wire ropes.	M 281-283*
stake pin	M 233-235*
staples	M 235-236*
steel hook	M 266-271*
stone chisels and picks	M 341-344*
tongs, iron	M 287-288*

	PAGE
Forging— <i>Continued</i>	
turn buckles	M 330-334*
upsetting	
bolts	M 241*
definition	M 315
rings	M 249
wood chisel	M 337-338
wrenches of steel	M 273-281*
<i>See also</i> Blacksmithing; Iron work; Welding	
Formal garden	G 151-155, 357
Forsythia	
selection principles	G 37
Foundations	
boat house	B 36
cellar	C 459
concrete	
box mold for	C 430, 458*
bracing	C 460*
leveling	C 460
pergola foundation	C 426-433
setting columns	C 435
setting wooden frame	C 435, 458
thickness of wall	C 459
depth for houses	C 458-459
house building	D 25-28*
posts	
for small buildings	C 443
setting	D 26-28*
setting and leveling	C 413-417*
Four o'clock	
sowing and blossoming time	G 161
Fowl. <i>See</i> Poultry	
Fox	
book about the silver fox	A 517
Foxglove	
biennial	G 322
characteristics	G 333, 334, 347, 365
digitalis made from	A 57
sowing and blossoming time	G 161
Fragrant herbs and grasses	A 64
Frames. <i>See</i> Picture frames	
Framing. <i>See</i> House framing; Picture frames	
Francis of Assisi, Saint	
stories about	H 25
Franklin, Benjamin	
kite flying	B 186
Fraternity pillows	N 376
French chalk for dry cleaning	H 332, 360
French hem	N 21
French knots	
letter outlining	N 150

	PAGE
French knots— <i>Continued</i>	
needle for	N 166
working	N 164*
French seal	A 501
Fresnel, Augustin Jean	
theory of light wave	E 345
Fringe	
knotting fringe	N 275-277*
raffia	N 274
Frogs	
taming	A 266
Fruit	
food values	H 255
selection of, for food	H 271
washing	H 295
<i>See also</i> names of fruits, e. g., Apple; Grape; Orange, etc.	
Fruit trees	
budding	G 251-253
distance to plant	G 258
protecting fruit from birds	A 461
seeds versus grafting	G 257-258
<i>See also</i> Grafting	
Frying	
fats for	H 282
methods	H 281
Fuchsias	
bedding plants	G 324
Fuel	
blacksmith's fuels	M 229
refuse timber	A 406
<i>See also</i> Coal	
Fulcrum	
principle of	B 21-28*
Fullering. <i>See</i> Blacksmithing	
Fumed oak and chestnut, process	D 233
Fungi	
shelf fungi	A 62
<i>See also</i> Mushrooms	
Fur	
dry cleaning	H 332
packing	H 347
<i>See also</i> Ermine; Mink; Mole; Muskrat; Rabbit; Sable; Seal; Skins; Skunk; Weasel	
Furnace	
draughts and dampers	H 227-230
gas and oil for heating steel.	M 290
house furnace, management and cleaning	H 233
muffle furnace for enameling.	M 199
Furniture	
antique	
mahogany table refinished	D 241-243

Furniture, antique—*Continued*

re-finishing	D 238-243
bedroom	D 57-58*
beds, designs	D 60*, 373*
box furniture, making	C 476-478*
care of furniture and fittings	H 121-145
castors, Acme pin	D 193
concrete furniture, making	D 201-209*
covers for	H 348
decorative value	D 46
dining-room	D 53-57*
enameling white	D 235
evolution of	C 291-292
hall furniture	D 47-50*
kitchen furniture	H 193-199
living room	D 50-53*
outdoor	C 408-416*, D 198-211*
designing, principles of	D 200
painted, cleaning	H 134
polish	H 133, 162
renovating	D 238-239
rustic	D 209-211*
woods for	A 410, K101-102
selection for use and beauty	H 115-120
upholstered, cleaning	H 132, 332
<i>See also</i> Book case; Book rack; Carpentry and Woodwork — Problems; Chairs; Desk; House decoration; Stains and staining; Tables; Tabourette; Wood; Wood carving; Wood finishing	

Furrows. *See* Gardening

Fusee, principle of B 80*

Fuses. *See* Electric fuses

G

Gaging lumber	C 186, 188
Gaillardia	
characteristics	G 332, 335
sowing and blossoming time	G 161
Gained or housed joints	C 255*
Galileo, Galilei	
barometer invention	B 256
Galloway, Beverly T.	
back yard swimming pool	A 282-286
Galvani, Luigi	
production of electric currents by chemical action	E 248
Galvanic electricity	E 248
Galvanized iron	E 248
soldering	M 44
Galveston sea wall	B 247
Gambling in housekeeping expenditures	H 70

	PAGE
Game and game birds	
cooking in camp	K 89, 90
creating a private game preserve	A 464-465
domesticating wild game	A 461-464
protecting	A 463
wild rice food for	A 78
<i>See also</i> Bantams; Guinea fowl; Pheasants	
Games	
list of one hundred games	K 326-328
<i>See also</i> Archery; Base ball; Camping; Canoeing; Coasting;	
Fishing; Football; Golf; Hockey; Hunting; Skating; Ski-	
ing; Swimming; Tennis; also names of games, e. g., Croquet;	
Marbles, etc.	
Garbage	
can	
cleaning	H 110, 221
location	H 221
disposal of	H 220
in country	H 222
Garden club	
election of officers	G 14
exhibits	G 201-208
reports on garden plots secured	G 3-12
vote to aid Oldfield Centre school grounds	G 14
vote to disbar girls	G 16
Garden hockey	K 350
Garden paths	
materials and making	G 358
Garden pests. <i>See</i> Insect pests	
Gardening	
city back yard	G 23, 134-141
compost pile	G 262
drills, making	G 156
exhibits	G 201-208
furrows, making	G 264*, 266-267
hill, meaning of	G 116
hoeing	G 266
indoor experiments.	G 28-40
money-making garden	G 368-376
selling garden fittings	G 372-373
plan, drawing	G 43-47*
paper plan for garden plots	G 261
preparing new plot	G 261-263
pricking out plants	G 100
raking	G 266
rows, direction to plant	G 260
rubbish, removing from new site	G 263
site for a garden, choosing	G 259-261
sowing seeds	G 268
spading	G 263-265
success, principles of	G 270

	PAGE
Gardening—Continued	
succession crops	G 92
thinning seedlings	G 268
transplanting	G 101-102, 118, 268-270
trenching	G 263-265*
work shop end of the garden	G 41-71*
<i>See also</i> Coldframe; Drainage; Fertilizers and manures; Flower gardening; Herbs; Hotbeds; Insect pests; Landscape gardening; Lawns; Plant food; Plants; School grounds; Seeds; Soils; Vegetable gardening; Vegetables; Vines; Weeds	
Gardening—Tools and appliances	
bulb flat, making	G 61*
dibber	G 47*
flower basket, weaving	G 61-64*
good versus poor tools	G 89-90
hoe, how to use	G 107
labels for plants, making	G 58*
measurements on tool handles	G 156
plant jardiniere.	G 66-68*
pot rest	G 68-71*
reel, making	G 51*
sieve, making	G 59-61
spades, how to use	G 88
stake, making	G 50*
sundial, making	G 64-66*
Gareth	
service in the king's kitchen.	H 20
Garlic, wild	
class and seed time	G 278
Garret playhouse	H 5
Gas and oil engines	
compared with steam engines	B 121, E 179
construction and fuel supply.	B 128-130
cylinder, what takes place in	E 178
water supply, quantity	B 130
<i>See also</i> Gasolene motors	
Gas furnace	
heating steel	M 290
Gas lighter, Electric	E 118-120*
Gas lighting	
average bill for careful families	H 76
Gas meters	
reading	H 238
Gas range	
baking bread in	H 283
cleaning	H 235
fire from fat, extinguishing	H 236
lighting	H 234
Gasolene	
composition	B 104
danger of explosion	B 104

PAGE

Gasolene automobiles. *See* AutomobilesGasolene launch. *See* Boat building; Launch

Gasolene motors

action	B 388
automobile frames, construction	B 396-401*
carbureter	B 95*
description and dimensions	B 95*
exhaust pipe	B 97-98, 103
expansion chamber	B 98
four-stroke cycle	B 388-391*
installing in launch	B 93-95
motive power, how obtained	B 388
motor-cycle, principle	B 387-388
muffler	B 97-98
multiple cylinders	B 393
petcock	B 99
pipe joints, finishing	B 102
power, developing	B 105-107
single cylinder	B 391, 394*
sparking	B 105-106
electric equipment for	E 178-203
stationary	
foundations	B 100-102
location	B 99
vibration, avoiding	B 100-102
stopping the engine	B 104
suction and overflow pipes	B 102
tank, setting	B 102
testing new engine	B 111
two-cylinder	B 392*
two-stroke cycle	B 388
vertical	B 391
water jacket	B 110
water supply	B 103-104

Gate hooks

forging	M 236-238*
---------	------------

Gearing. *See* Mechanical movements

Geese

book about	A 517
breeds	A 189, K 181
domesticating wild geese	A 463
fattening for market	A 189
feathers, plucking	A 189-190
feeding and caring for goslings	A 188
food value	H 253
how to select for cooking	H 271
raising	A 188-190
setting eggs	A 188

Genista

indoor plant	G 197
--------------	-------

Georgia pine. *See* Pine

	PAGE
Geraniums	
bedding plant	G 323
slipping	G 188-190
wild geranium	G 342
window box plant	G 193
Germination of seeds. <i>See</i> Seeds	
Gifts	
playthings outgrown	H 10
spent in advance, offense of	H 70
the tenth of your income	H 81
Gilding	
lettering name on boat	B 131
Gimlet bit	C 194*, 196
Ginger root	
use of	A 58
Girders, wooden	
strength of materials	B 45
Girls' clubs. <i>See</i> Clubs	
Girls	
outdoor sports for	K 318-325
Girl's room	
color scheme	N 375, 378, 379
cretonne versus linen for furnishings	N 373
curtains	N 380-381
stenciling furnishings	N 377
wall decorations	N 377
window seat	N 374
Girl's secret	G 25-27
Glass	
cutting with a wheel cutter	D 196
for lamp shade	M 400
kitchen utensils.	H 203
leaded glass, soldering.	D 196-197*
polishing	H 134
washing	H 180
Glider flying machine	B 179
Glove box. <i>See</i> Boxes	
Gloves	
cleaning chamois gloves	H 331
Glue	
preparing and using	C 225
<i>See also</i> Carpentry	
Gnomon	
making	B 209
Goat	
age, telling	A 111
Angora	
commercial value	A 114
fleece	A 109, 114
book about	A 517
common goat, advantages of	A 114-116

	PAGE
Goat— <i>Continued</i>	
feeding	A 111-113
housing	A 109, 113
kid, care of	A 111
market value	A 117
milk, value	A 115
products	A 110
profit from	A 107-108
raising	A 107-118
experiment in New England	A 116-118
rate of increase	A 115
selecting for a herd	A 110
space needed	A 109, 114
value in reclaiming land	A 116-118
water supply	A 109
Goat skin	
for leather work	N 84*
Godetia	
characteristics	G 322, 329, 331
Gold fish	
age	A 227
book about	A 517
characteristics	A 226
color of young	A 231
diseases	A 232
eggs, care of	A 229
enemies	A 233
food	A 228, 231
habits	A 228
hospital	A 232
making an aquarium	K 160-162
raising for profit	A 228-233
rearing tank	A 228, 230
spawning pond	A 229
storage tank	A 231
training	A 227
winter tank	A 232
Golden bell	
characteristics	G 355
Golden glow	
characteristics	G 334, 365
Golden oak finish	D 230
Golden seal	
value	A 57
Golf	K 296-300*, 351-354
addressing	K 297*
bogic score	K 300
caddy	K 352
clubs	K 299*, 352
course	K 296, 351
hole	K 297, 351

	PAGE
Golf— <i>Continued</i>	
links	K 353
playing the game	K 352
putting	K 300
green	K 297, 352
scoring	K 298, 300
tee	K 297
Golf-croquet	K 354
Gong. <i>See</i> Brass work—bell	
Gophers	
destroying	A 493
Gouge	
blacksmith's tool	M 225
sharpening	C 179-184*
woodworker's tool	C 258-260*
Governors (Machinery)	
gyroscope governor	B 335*
steam engine	B 313-316*, 329
Grafting	
cleft grafting	G 257-258
improving stock	G 254-258
occupation for boys	A 409*
scion and stock	G 254-256
season for	G 255
tongue grafting	G 256
wax making	G 256
whip grafting	G 256-257
Grain	
food value	H 250, 254
<i>See also</i> Corn	
Grandfather's clock	
making	C 284-290*
Granite for roadway	G 85
Grape	
food value	H 255
green grape jelly, receipt	A 15
wild grapes	
picking	A 14
jelly receipt	A 15
Grape juice	
book about	A 518
food value	A 417
making	A 418-421
Grass seed	
kind for rapid growth.	G 76
preparing the soil	G 74-76
sowing	G 77
Grass stain	
removing	H 359
Grasses	
basketry uses	A 64

	PAGE
Grasshoppers	
distinguishing young from old	A 393
garden pests	G 282
Grates. <i>See</i> Fireplaces	
Gravel	
road beds	G 85
<i>See also</i> Cement walks	
Graver	
definition of.	M 209
Gravitation	
definition	E 341
laws of	B 277-280
principle of	B 57-59
Gravity	
acceleration, meaning of	B 278
force, meaning of	B 277
specific gravity, meaning of	B 279-280
Grease spots	
removing	H 360
Greek cross	C 322
Greens (Cookery)	
dandelion greens	A 63
Greens, Christmas	A 50-57
Grinding machine	
edge runners or chasers for crushing	B 336*
Grindstones	
grinding tools with	C 181-184*
principle of	B 28
types and uses	C 181*
Grosbeak, rose-breasted	
insect destroyer	A 457
migration	K 176
Grounds. <i>See</i> School grounds	
Grouse	
book about	A 519
Guests	
entertainment of	H 366-369
Guinea fowl	
book about	A 517
characteristics	A 179, 181-182
eggs, value	A 179
feeding	A 180
marketing	A 179, 181
raising	A 180-182
Guinea pigs	
as pets	K 183
making a house for	C 451-454*
raising for pets	A 205
<i>See also</i> Cavies	
Gum. <i>See</i> Spruce gum	

	PAGE
Gum tree	
sweet gum, red gum, or liquid amber	C 562
Gun. <i>See</i> Firearms; Rifles; Shotgun	
Gussets. <i>See</i> Sewing	
Gymnastics	
outdoor life versus gymnastics	K 11
pull up bar, making	C 270*
Gyroscope	
applied to aeroplanes	B 169
Bohnenberger's machine	B 334*
construction of	B 267-268*
mechanism	B 334*

H

Hab-enihan (Game)	K 354
Hacmatack	C 530
Hail	
formation	B 363-366
Haley over (Game)	K 355
Halibut	
food value	H 253
Hall clock	
design and construction	D 193-198*
Hall furniture	D 47-50*
Halley's comet	
ether waves sent forth by	E 333-338
Halley's thermometer	B 261
Halved joints	C 253*
Ham. <i>See</i> Pork	
Hamburg steak	H 268
Hammer	
adze eye claw hammer	C 203*
claw hammer	C 203*
cross peen hammer, making	M 316-318*
hand hammer	M 224*
handles, making	C 271*
hard wood peg for copper work	M 28
peen	M 254*
planishing hammer.	M 8*
raising hammer.	M 7*
round peen hammer, making	M 318-322*
set hammer	M 225*, 323*
shaping hammer	M 7*
Hammocks	
making couch hammocks	C 478-480*
Hand ball	K 355
Hand polo	K 356
Hand tennis	K 356
Handkerchief	
drawnwork	N 213-219*

	PAGE
Handkerchief—Continued	
hemstitching	N 207-209*
rolling the edge	N 21*
Handkerchief box. <i>See</i> Boxes	
Handles	
wooden, making	C 271*
<i>See also</i> Copper work; Metal work	
Hands	
removing stains	E 357
Hardanger embroidery	N 190-197*
bars, weaving	N 192
block stitch	N 190-191*
materials.	N 190
picots	N 192*, 194*
pin cushion tops	N 193-196*
pyramid stitch	N 195*
star pattern.	N 191*
Hardening metals. <i>See</i> Steel	
Hardie	
blacksmith tool.	M 226*
making	M 322*
Hardy plants	
meaning	G 317
Hare	
“varying” hare	A 499-500
Hare and hounds	K 17
Harebell, Carpathian	
characteristics	G 334
Harrowing	G 124
Harvesting nature's crops	A 8-100
Haskins, Charles Waldo	
How to keep household accounts, recommended	H 99
Hat	
baby's buttoned hat	N 174-175
how to select a hat	D 125
lingerie hat	N 169*, 171-174
raffia hats	N 262-270
for doll	N 253-255
Hat ball	K 357
Hat pin	
copper work	D 348-350*, M 64-69
Hat pin holder	
copper work	M 69-71*
Hatchet handle	
making	C 271*
Haws (fruit)	
location and uses	A 24
Hawthorne, Nathaniel	
quotation	H 43
Hawthorne, English	
characteristics	G 366

	PAGE
Hayes, Ruth	
success with chickens	A 160-163
Hazel nut	
cultivating	A 33-34
for fence hedge	A 34
gathering time	A 35
pruning bushes	A 35
Health. <i>See</i> Hygiene	
Hearth	
meaning	H 224
Heat	
British thermal unit	E 100-101
calorie and caloric, meaning	E 342
generation	E 98-100
transmission by radiation.	E 314
waves	
length	E 316
production and velocity	E 313-315
theory	E 343
Heating	
automatic control of temperature	E 306-308*
regulation by electric flasher.	E 120-125*
<i>See also</i> Electric heating; Fuel; Furnace; Steam radiators	
Hedebo embroidery	N 202-206*
Hedges	
hazel bush	A 34
poplar versus evergreen	G 82
shrubs for	G 357
Helianthus	
background plant	G 320
sowing and blossoming time	G 161
Helicoptere flying machine	B 163
Heliotrope	
bedding plant	G 324
characteristics of winter plant	G 333
Hellebore, white	
insecticide	G 117, 235
Hemlock	
characteristics	C 539
Hemming. <i>See</i> Sewing	
Hemp ropes. <i>See</i> Ropes	
Hemstitching	
double hemstitching	N 210*
handkerchiefs	N 207-209*
padded	N 215-216*
Hen coops. <i>See</i> Poultry	
Hen manure. <i>See</i> Fertilizers and manures	
Henry, Joseph	
first to make electro-magnets	E 14
Hens. <i>See</i> Poultry	

	PAGE
Hepatica	
blossoming time	G 339
habits and characteristics	G 339, 364
Herbarium	K 155
Herbs	
bee balm	G 347
for basket weaving and sachets	A 64
in colonial gardens	G 326
list of	G 327
soil for	G 326
uses	G 326
Hero engine	B 114*
Herring	
food value	H 253
Herring-bone	
embroidery stitch	N 101*
Hertz, Heinrich	
discovery of electric waves	E 346
Hertzian waves	E 346
Hewitt, Peter Cooper	
inventor of mercury vapor lamp	E 156
Hexagon	
problem in estimating lumber for hexagon floor	C 508
Hickory	
characteristics	A 39-40, C 564
food value of nuts	H 256
lumber value	A 39
varieties	A 40
Hide and seek	K 361
Hides. <i>See</i> Skins	
High kick.	K 357
Hinges	
cooper or brass, metal work	M 116*
copper or silver, metal work	M 100-106*
iron hinge and butt, making	M 283-285*
ornamental, making	M 391-393*
riveting	M 114*
setting	C 239
Hives. <i>See</i> Bees	
Hockey	
forward	K 214
garden hockey	K 350
goal tender	K 214
ice hockey	K 212-215*, 358
lawn hockey	K 367
"puck"	K 212
rink	K 215
rules	K 215
skates, cost	K 358*
team	K 214, 358

	PAGE
Hockey— <i>Continued</i>	
uniform	K 213, 358
<i>See also</i> Curling	
Hoe	
forging a garden hoe	M 335-337*
forging a grub hoe.	M 328-330*
how to use	G 107-266
Hog. <i>See</i> Swine	
Hogan, Clarence A	
raising chickens	A 159
Hoisting machinery	
inclined plane	B 52-62, 64
lewis for lifting stones	B 347*
lifting magnets	E 79-81*
screws	B 139-147
tongs for lifting stones	B 348*
<i>See also</i> Capstan; Pulleys; Windlass	
Holly	
care of trees	A 52
characteristics	C 560
wood, value	A 52
wreaths, making and marketing.	A 52-53
Hollyhocks	
background plant	G 320
characteristics	G 334, 365
sowing and blossoming time	G 161
Home decoration. <i>See</i> House decoration	
Homemaking	
art of	H 44
<i>See also</i> Housekeeping	
Homing pigeons	K 180
Honey	
cooking with	A 327
food value	H 254
marketing	A 326
plants which supply	A 322
wholesomeness	A 326
<i>See also</i> Bees	
Honeysuckle	
decorative value	G 359
Honiton applique	N 237
Hood	
knitted	N 366-368*
Hooke, Robert	
wave theory of light	E 343
Hooker, Ava	
a start with poultry	A 172-177
Hooks	
centrifugal check hooks	B 326*
forging	
gate hooks	M 236-238*

	PAGE
Hooks, forging — <i>Continued</i>	
harness hooks	M 238*
steel hook	M 266-271*
Hooks and eyes, sewing on	N 24-25*
Hoops, embroidery	N 122-123
Hop hornbeam, or iron wood	
characteristics	C 558
Hop vine	
value	G 360
Hopover(Game)	K 358
Hopscotch	K 359
Hopper joints	C 251*
Horizontal bar	
making a pull up bar	C 270*
Horse	
book about	A 517
raising colts	A 101-103
training	A 252-255, 258
Horse chestnut	G 367
Horse power	
converting into kilowatts	B 125
estimating	B 122-125
estimating energy in coal	E 6
Horsemanship	K 225-232*
bridle wise horse	K 227
care of the horse	K 230
girls as riders	K 321
jumping fences	K 231*
mounting	K 226-227*
packing a horse	K 230
saddles, selecting	K 225-226*
selecting the horse	K 232
styles of riding	K 227-228
Horseshoeing	M 221-222*
heels	M 222
making shoes	M 218-222*
mule shoes and horse shoes	M 218
toe calk	M 221*
Hospitality. <i>See</i> Guests	
Hot water bottle	
electric heating pad	E 117
Hotbed	
coldframe changed to	G 38
directions for making	G 48-50*
preparing for winter	G 108, 109
time to transfer plants	G 235
Ho-ti and the roast pig	H 18
House cleaning	H 337-352
appliances for	H 140, 147
order of work	H 143-145
principles	H 142

	PAGE
House cleaning— <i>Continued</i>	
repairs and renovations	H 338, 339
small spaces	H 338
unobtrusive methods	H 128
weekly schedule	H 108
woodwork	H 123
<i>See also</i> Ceilings; Cellar; Curtains; Floors; Flues; Furnace; Furniture; Garbage can; Kitchen; Lamps, oil; Laundry work; Matting; Painting; Paper-hanging; Pictures; Re- frigerator; Rugs; Shades; Tiles; Vacuum cleaners; Walls; Windows	
House decoration	
ceilings	D 36
correcting defects of height	D 38
color scheme	D 16-20
harmony	D 35-36
interior woodwork	D 20
southern and northern exposures	D 18-19
corrective for architectural defects	D 37-38
decorative fabrics	D 95-120
Dutch room, suggestion	N 379
experimenting	D 41-43
floors, color scheme	D 16, 20, 36
French room, suggestions	N 379
furniture	
arrangement	D 59-63
selection	D 46-59
modifying rules	D 43-45
overcrowding	D 62
principles	D 34-35
re-decorating old houses	D 37
relation to building plan	D 12-13
summer cottage suggestions	D 370
ten commandments	D 45-46
use and beauty of possessions	H 115-120
walls	D 36, 39-41
stenciling	N 76
window seats	N 374-375
<i>See also</i> Copper work; Curtains; Cushions; Floral decoration; Furniture; Girl's room; Leather work; Metal work; Pic- tures; Portieres; Pottery; Stenciling; Weaving	
House fly. <i>See</i> Flies	
House framing	
construction details	D 25-32*
drawings and instructions	C 461-464*
corner framing	C 462*
corners, finishing poultry house	C 446*
paper for siding	C 471
siding	
cheap houses	C 445
cottages and bungalows	C 464

PAGE

House framing, siding — *Continued*

 putting on weather boards C 471

 tongue and groove boards for C 475

 small and cheap houses C 444-445*

 studding for a boat house B 37-38*

 summer house construction C 413-417*

 window and door frames, setting C 469

House plans. *See* Architecture

Household pests H 361-364

Housekeeper

 effacement of H 383-384

 health of H 385

 stories of inspiration H 388-389

 worries H 384

See also House cleaning; Housekeeping; Servants

Housekeeping

 accounts, keeping H 87-100

 adjustment of work H 112

 alleviations H 333

 as a profession H 382-387

 bedroom work H 146-159

closing the house

 marking wrapped articles H 351

 meters, shutting off H 351

 packing H 347-349

 repairing household appliances H 349

 traps, care of H 351

 daily work H 103

 dignity of H 387

 dining-room and pantry work H 51, 160-187

 emergencies H 353-369

 expenses, division of income H 74-80

 home training for H 46

 inspiration H 388-389

 learning and helping H 43-59

 learning by observation H 58

 menus and marketing H 244-273

 My heritage H 63-68

 objections to H 382

 opening the house, unpacking H 352

 playhouse H 3-40

 possessions, use and beauty H 115-120

 rest provisions H 113

 schedules of work H 101-113

 school lessons helpful in H 45

 servants H 370-381

 upstairs work H 146-159

See also Cookery; Food; Furniture; House cleaning; House decoration; Insect pests; Ironing; Kitchen; Laundry; Marketing; Needle work; Plumbing; Receipts; Servants; Sewing

House plants. *See* Plants

	PAGE
Huckleberries	
canning factories	A 12
picking	A 13
where and how they grow	A 11, C 514
Hudson seal	A 491
Hugo, Victor	
his description of Paris sewers mentioned	H 216
Humming birds	
taming	A 265
Humus	
soil composition	G 8, 9
Hunt the sheep	K 360
Hunting	
choosing companions	K 118
training dogs for	K 190-192
<i>See also</i> Game and game birds; Shooting	
Huygens, Christian	
wave theory of light	E 344
Hyacinth	
cone developer	G 175
indoor planting	G 166, 167
planting and blooming time	G 177, 178
varieties	G 167, 177, 178
water growing	G 169, 175
Hydrangea	
characteristics	G 356, 365
Hydro-electric stations in the United States	E 202-207
Hygiene	
how to keep well	K 3-5
outdoor life	K 6-9
rules of health	K 12
value of play	K 4, 10
<i>See also</i> Athletics; Exercise; Walking	
Hygrometer	
construction	B 231-232*
Hylo electric lamps	E 138*
Hyperbola	
describing	B 338

I

I spy	K 361
Ice	
home-made	A 435-437
Ice box. <i>See</i> Refrigerator	
Ice Hockey. <i>See</i> Hockey	
Ice-shaver	
forging	M 327*
Incandescent lamps. <i>See</i> Electric lamps, Incandescent	
Inclined plane	
principle of	B 52-62*

	PAGE
Inclined plane— <i>Continued</i>	
rule for power	B 64
Income	
allowances, management of	H 80
gifts, provisions for	H 81
how to divide for family needs	H 72-85
increasing, ways to avoid	H 73
management of	H 70-86
savings from	H 82
uncertain, management of	H 71
Incubators	K 197-199
electric	E 114
temperature regulator	E 124*
Indian bracelet	
making	M 176-177*
Indian proverb about home making	H 44
Indian's plume (Bee balm)	G 333, 347
Induction (Electricity)	
current induced	
by interrupting the circuit	E 184
by moving the magnet	E 17-18
direction of induced currents	E 186
experiments	E 349-352
human voice as interrupter	E 282-283
piano strings as interrupter	E 281
telephone induction coil	E 279-281*
tuning fork as an interrupter	E 280
wireless spark coil	E 321-322*
Ink stains	
removing	H 359
Ink well holder	
copper work	M 117-121*
gouge work	C 261-263*
Inky caps, mushrooms	A 90
Inlaying, metal	M 362
Inlaying, wood	C 319-331*
borders, designs and making	C 324-328*
buhlwork	C 329
building up designs	C 320-322*, 323*, 329*
checkerboard, design and making	C 326-327*
curved designs	C 328
gluing process	C 323
marquetry work	C 328
placing the design	C 324
thickness of veneer	C 319
woods suitable for	C 319
Inoculation of soil	G 119
Insect pests	G 280-295, K 167-168, H 361-364
ants	G 283
asparagus beetle, remedy	G 287
bean anthracnose	G 288

Insect pests—Continued

bed bugs	H 363-364
book about	A 519
cabbage worm	G 125, 288
caterpillars	G 282, 285, 287, 290
cauliflower lice and maggots	G 289
celery caterpillar	G 287, 290
chestnut weevil	A 33
chicken lice	A 148, 149
cockroaches	H 362
cut worms	G 284, 292, 293
destruction of, by birds and toads	A 455-457, G 280-281
detecting.	G 283-284
eggplants	G 305
gnawing class, remedy	G 281-282
grasshoppers	G 282
hornworm	G 292
house plant pests	G 199
household pests.	H 361-364
leaf-hopper	G 293
moths, prevention and extermination of	H 362
plant lice	G 284, 291, 293
potato bug	G 287, 292
red spider	G 293
rose slug.	G 284, 293
slugs	G 117, 284, 285, 293
squash bug	G 287, 291, 292
striped beetle	G 117, 285, 287, 292
sucking class	G 282
tomato worm	G 286
water bugs	H 362
<i>See also</i> Flies; Insecticides; Mosquitoes	

Insecticides

bordeaux mixture	G 121, 294
kerosene emulsion	G 130
Paris green	G 130

Insects

adult stage	A 394
chrysalides	A 394, 396
development	A 393-395
distinguishing young from old	A 391-393
egg stage	A 393
habits	A 388-391
homes	A 397-399
injurious and helpful	K 167-168
larval stage	A 394
life of a butterfly	A 395-397
pupa stage	A 394
<i>See also</i> Ants; Beetles; Butterflies; Dragon-flies; Grasshoppers; Moths; Silkworms; Spiders; Wasps	

	PAGE
Insects — Collecting and preserving	
baiting moths	A 400-402, K 153-154
sugar receipt	A 401, K 153
books about	A 519
breeding cage, making	A 399-400*
cases for preserving	A 385, 387*, 388, C 395-397
cornstalk pith for lining	A 63
classifying	A 386-389
egg shell, mounting	A 396
eggs of butterflies	A 395
filing cabinet, making	C 395-397
killing bottle, making and using a cyanide bottle	A 378-380*, 382, K 151-152*
mounting	A 380-386*, K 152*
net making	A 376-378*
outfit	A 375, K 151
pinning butterflies and beetles	A 383-385*
pins for mounting	A 380
spreading board	A 381*
times and localities for collecting	A 388-389
Insertion. <i>See</i> Crocheting	
Instruments. <i>See</i> Tools	
Insulation. <i>See</i> Electric insulators and insulation	
Insurance. <i>See</i> Life insurance	
Intercollegiate Amateur Athletic Association of America	
best records	K 336
events contested for	K 360
rowing record	K 383
Interior decoration. <i>See</i> House decoration	
Invalid tray	
preparing	H 365-366
Inventions	
ancient and modern	B 271-277
<i>See also</i> Aeroplanes; Matches; Typewriters; Wireless telegraph; and words beginning Electric	
Iris	
blue flag	G 366
border plant	G 321
dwarf, characteristics	G 334, 364
English, planting and blooming time	G 178
German, characteristics	G 365
Japanese, characteristics	G 333
Spanish, planting and blooming time	G 178
varieties	G 321
Irish crochet	N 333-350*
baby Irish pattern.	N 344-346*
belt	N 335-337*
doily with edge	N 335*
Dutch collar	N 346-350*
edging	N 344-345*
grapes	N 345

	PAGE
Irish crochet— <i>Continued</i>	
jabot	N 342-344*
leaves	N 345
materials	N 333
motifs, joining	N 334
rose	N 339-340, 344
shamrock	N 341
tie rose	N 337-338*
wheel pattern with rose and straps of shamrock	N 338-342*
Irish stew; story	H 14
Iron	
galvanized	
incorrectly named	E 248
soldering	M 44
magnetic properties	E 13
oxidation, preventing	M 247
pig iron	M 230
stretching processes	M 315
wrought iron	M 230-232
Iron work	
bending corner	M 271-273*
bracket, making	M 393-395*
bulbs, making	M 385-388*
candlestick, making	M 380-383*
spiral	M 388-391*
chains, welding	M 250-253*
decorative forgings, suggestions	D 364
handles	M 384
hinge, making	M 391*
hinge and butt, making	M 283-285*
kettle stand, making	M 406-409*
lamp holder for	M 408
lamp, making	M 396-405*
holder	M 408
shade and holder	M 399-400
punching holes in	M 245*
rings, welding	M 248-250*, 254*
spirals, making	M 385
tongs, forging	M 285-288*
twists	M 383
braided strand	M 384
umbrella stand	M 409
wrench, forging	M 273*
<i>See also</i> Andirons; Blacksmithing; Fire tools; Welding	
Ironing	
bed linen	H 327
board for	H 315
clothes-horse for	H 318
electric irons for	E 107-110, 243*
embroidery	H 329
iron, care and use	H 316

PAGE

Ironing—*Continued*

iron holders	H 317
iron-stand	H 318
lace	H 330
process	H 326-327
scorched places	H 335
starch sticking, to prevent	H 335
table linen	H 327
wax, cloths and paper	H 318

Ironwood

characteristics	C 558
---------------------------	-------

Irrigation

book about	A 518
Chinese treadmill device	B 337*
Persian wheel device	B 343*

J

Jabot

Irish crochet	N 342-344*
-------------------------	------------

Jack fagots

K 362

Jack-in-the-pulpit

description of	G 344
--------------------------	-------

Jacket. *See* Crocheting

Jai-a-li (Pelota)	K 376
-----------------------------	-------

Jam

thimbleberry	A 11
------------------------	------

Japan barberry

hedge shrub	G 357
-----------------------	-------

Japan quince

hedge shrub.	G 357
----------------------	-------

Japanese clematis

characteristics	G 365
---------------------------	-------

Japanese fan ball

K 362

Japanese hop

characteristics	G 331
---------------------------	-------

Japanese snow flower

characteristics	G 356
---------------------------	-------

Japanese snowball

characteristics	G 356
---------------------------	-------

Jardiniere. *See* Plant stand

Jelly

barberry jelly	A 17
--------------------------	------

green grape jelly	A 15
-----------------------------	------

Jerusalem cherry tree, indoor plant

G 197

Jew fish

catching	K 126
--------------------	-------

Jewel box

copper work.	M 107-115*
----------------------	------------

Jeweler's tools. *See* Tools

	PAGE
Jewelry. <i>See</i> Silver work	
Joe Pye weed	
habits and characteristics.	G 349
story of name	G 348
Johnny cake	
camp cooking	K 88
Joints	
butt	C 251*
clamping mitre joints	D 144*
dado	C 236*, 255*
dovetail	
blind	C 256*
box	C 314*, 256*
half-blind	C 256*
lap	C 253*
single	C 313-314*
single open.	C 256*
doweled	D 148*, C 251
gained or housed	C 255*
gluing	D 140-141*, 144-146*
mitre joints	C 232-234
halved	C 253*
lap joint	D 147*
hopper	C 251*
joint edge, definition of	C 186
kinds and construction	D 140-141*, 143-148*
lap	C 251, 253*, 256*
lock	C 255*
mitre	C 232-234*, D 143-146*
lap	C 256*
mortise and tenon	C 250*, D 147*, 154*
blind	C 255*
draw boring	C 415
end	C 256*
relished	C 256*
through.	C 255*
notched	C 255*
rabbeted	C 255*
rubbed joint	C 251*
splice or scarf	C 257*
stretcher	C 256*
tongue and groove.	C 257*
trick	C 257*
Jonquil	
narcissus family	C 169
planting and blooming time	G 178
July	
blooming plants	G 365
June	
blooming plants	G 365

	K	PAGE
Kale		
planting and care		G 299
time to plant		G 234
Keel. <i>See</i> Boat building		
Kelvin, Lord		
and the Atlantic cable		E 66
Kennels. <i>See</i> Dogs		
Kensington stitch		
flower embroidery		N 178-179*
Kentucky coffee tree		C 566
Kerosene		
cleaning woodwork.		H 124, 134
lighting fires with		H 231
Kerosene emulsion		
insecticide		G 284, 289
receipt		G 294, 295
Key rack		
carving design		C 123
whittling.		C 12-14*
Key tag		
whittling.		C 14*
Kick the stick (Game)		K 363
Kiln		
lumber kiln method		C 524-525
portable pottery kiln		D 299-301*
Kilowatt		
converting into H. P. B.		B 125
hour		E 41
Kindling wood		
cutting and collecting as a business		A 404-408
King Alfred. <i>See</i> Alfred, King		
Kingbird		
insect eater		A 456, 457
migration		K 176
King of the castle (Game)		K 364
Kitchen		
chairs		H 196
cleaning weekly		H 110
clock		H 199
curtains		H 198
floors		H 191-193
furnishings		H 188-200
hooks.		H 198
house plan		D 10
light fixtures		H 199
ornament		H 199
rugs		H 193
shelves		H 197
sink		H 194
size		H 188

	PAGE
Kitchen— <i>Continued</i>	
tables	H 194
walls and woodwork	H 189
<i>See also</i> Ranges	
Kitchen utensils	H 200-207
aluminum, advantages and care	H 202, 206
bread board, making	C 222-223*
care of	H 205
materials	H 201
selection	H 203, 207
sugar scoop and ladle, making	C 272*
<i>See also</i> Soldering	
Kites	B 185-200
aeroplane kite, making	C 84-87*
American Malay	
launching	C 92
making	C 86*
box kites	
launching	B 191, C 92
making	B 189-191*
bridle, fastening	C 88*, 91*
cellular, making	B 191-192*, C 91-92*
Chinese, designs	C 96
coverings, importance of	C 94
detail drawings	C 91*
Eddy kite, making	C 86*
flying	C 88-90
principle of	B 185-189*
groups, flying	B 192*, C 90
joining sticks	C 84-85, 87*
lines	C 88
making	B 187-195, C 84-96*
materials	C 85, 88, 94
photographing by means of	B 194
record flight	B 185-187
reels for	C 88
sails	C 85
shape	B 188
stability, principle of	C 94
tailless	C 84-95
tails, principle of	B 188
tandem	C 95*
tetrahedral, making	C 92-94*
war kites, making	B 193*
wind velocity table	B 198
Knife. <i>See</i> Knives	
Knife box	
making	C 223-226*
Knife work. <i>See</i> Whittling; Wood carving;	
Knights of the Round Table. <i>See</i> Round Table	
Knitting	N 351-371*

PAGE

Knitting—Continued

baby hood	N 366-368*
baby vest	N 368
basket stitch	N 358*
bootees	N 363-366*
doll's cap	N 362*
doll's cape	N 360*
doll's jacket	N 360-362*
doll's leggings	N 363*
German method	N 352*
lace pine pattern	N 369-371
materials for	N 351
patterns	N 360-371*
shawl	
finishing edge	N 357
long	N 356-358
wide	N 358, 359
stitches	
basket stitch	N 358*
binding off	N 354-356
casting off	N 354-356
casting on	N 351*
popcorn	N 356*
purling	N 353*
washing	N 332
widening the row	N 355

Knives

butcher knife, forging	M 354-357*
steel, washing	H 184
whittling	C 6*

Knot holes

how made	A 442
--------------------	-------

Knots

raffia knotting	N 271-275*
silk, cotton, or linen	N 275-277
<i>See also Sewing</i>	

Knuckle of veal	H 270
---------------------------	-------

Kodak	K 304
-----------------	-------

Kohlrabi

planting and care	G 300
-----------------------------	-------

L

Labeling. *See* Insects — Collections; Plants — Collections; Shells

Labels for plant markers, making	G 58*
--	-------

Lace and lace making	N 227-241*
--------------------------------	------------

basting braid	N 227, 228
-------------------------	------------

Brussels stitch, single and double	N 229, 231*
--	-------------

buttonholed bar	N 233*
---------------------------	--------

Connemara lace	N 235-237*
--------------------------	------------

dyeing lace	H 331, N 238
-----------------------	--------------

	PAGE
Lace and lace making— <i>Continued</i>	
edge finishing	N 234
fan stitch	N 232*
fagotting	N 229*
foundation stitch, mesh or net	N 230
Honiton applique	N 237
braids for	N 236-238
Irish crochet lace	N 333-350*
knitted lace, pine pattern	N 369-371
Limerick darning	N 234
maltese cross, design	N 233*
over handing on	N 15*
point lace	N 227
Brazilian	N 238-241*
Renaissance	N 227
rolling and whip stitching on	N 22
spider stitch	N 231-232*
Teneriffe or Brazilian point	N 238-241*
twisted bar stitch	N 124*, 233
washing	H 330
whitening	H 331
Lacquer	
for brass.	M 140
Lacrosse	K 364
Ladder stitch	N 158-159
Lady bug,	
value to farmers	K 168
Lakes	
tides	B 228
Lamb	
cuts and their uses	H 270
food value	
combinations	H 259
table	H 253
<i>See also</i> Sheep	
Lamp	
copper work, electric lamp	M 92-96*
steel base, making	M 401-403*
wrought iron	
making	M 396-405*
shade holder	M 399
Lamp, oil	
care of	H 136
trimming wicks.	H 137
Lamp shade	
copper work	M 96-99*
glass for	M 400
<i>See also</i> Candle shade	
Land drainage. <i>See</i> Drainage	
Landscape gardening	G 351-367
formal gardens	G 357

	PAGE
Landscape gardening— <i>Continued</i>	
flower gardens	G 360-362
garden furnishings	G 363
hedges	G 357
helping nature	G 363
lawns	
flowers, what and where to plant	G 360
treatment of	G 352
points to observe	G 362-363
principles of.	G 351
purpose	G 357
screening unsightly places	G 362
shrubs	
grouping	G 354-355
selection principle.	G 357
table of.	G 355-356
summer house, location	G 363
trees, selection and grouping.	G 353-354, 357
vines	G 359
water garden	G 362
wild flower garden	G 362
<i>See also</i> Flower gardening; Gardening; Shrubs; Trees	
Lantern	
metal work	M 405-406*
Lantern wheel	B 322*
Lap joints	C 251, 253*
Laplace, Pierre Simon	
Corpuscular theory of light	E 344
Larch	
characteristics	C 530
Larkspur	
background plant	G 320
characteristics	G 365
oriental, characteristics	G 333, 335
sowing and blossoming time	G 161, 320
varieties	G 319, 320
Larva. <i>See</i> Insects	
Last tag (Game)	K 370
Lathe tools	
making	M 300-306*
Lattice work	D 209-211*
Launch	
launching the boat	B 134, 137-138
rules for running	B 74-75
<i>See also</i> Boat building; Gasoline motors	
Laundry work	
appliances	H 312-320
blankets	H 324, 328
bluing	H 18, 320
removing	H 334
boiling clothes	H 323

	PAGE
Laundry work— <i>Continued</i>	
chamois gloves	H 331
clothes basket	H 315
clothes line, care of	H 314
clothes pins, care of	H 314
colored clothes	H 324
curtains	H 328-329
economizing	H 333
electric washing machinery	E 241-243*
embroidery	H 329, N 136-137
emergencies	H 333-336
freezing weather	H 334
hanging out clothes	H 323, 325
knitting and crochet work	N 332
lace	H 330
muddy water	H 334
poles for	H 315
rinsing clothes	H 323
schedule for wash days	H 106
silk clothes	H 325
soaking clothes	H 322
soap	H 319
soiled clothes, care of	H 321
sorting clothes	H 318
sprinkling and folding clothes	H 325-327
starch	H 319
starching clothes	H 323
stormy days	H 333
stove	H 315
tubs, care of	H 313
wash board	H 313
wash boiler, care of	H 313
wash stick	H 314
washing process	H 321-322
white clothes	H 321
woolens	H 324
wringer	H 314
<i>See also</i> Ironing	
Lavender	
growing	G 327
Lavender stick	
making	A 424-427*
Lawn bowling	K 366
Lawn bowls	K 365
Lawn hockey	K 367
Lawn mower	
care of	A 432-433
Lawn skittles	K 368-370
Lawn tennis. <i>See</i> Tennis	
Lawns	
crocuses in	A 169, 434

PAGE

Lawns—*Continued*

embankment wall, making	G 73
flowers in, what and where to plant	G 360
grading	G 74
landscape gardening	G 352
mowing	A 432-433
rolling	G 75
Layering plants	G 250
Laying the table. <i>See</i> Setting the table	
Lazy tongs	B 313*
Lead	
bath to prevent steel oxidation	M 284, 291
soldering	M 44
Leaded glass	
cutting and soldering	D 196-197*
Leaf hopper	G 293
Leaf mold	
making	A 421-424
Leaks. <i>See</i> Plumbing	
Leap frog.	K 347
Spanish fly	K 385
Leather work	D 321-345*, N 83-90*
applique	N 83, 85*
applying designs	N 87-90
articles made from, list	N 89
belt designs and tooling	D 324-328*
book cover	D 342-345*
card case	D 338-340*
cover for note book	D 331-334*
cutting	N 88, 89
dampening for tracing	N 88
decoration, principles of	D 322
designing	N 86
desk pad	D 336-338*
knots	D 330*
lining articles	D 339, 341
mat, design and tooling	D 328-330*
paste, receipt for	N 88, 95, 96
pasting	N 85, 89
pen wiper, designs and tooling	D 330-331*
planning a skin	N 84*
polishing	N 96
purse	D 340-342*
skins suitable for	D 322, N 83-85*, 92
stitching by hand	D 333-335*
tinting	N 96
tooled leather	N 91-97*
embossing with die	N 93*
paste, receipt for	N 95, 96
polishing	N 96
process	D 326-328*, N 92-94

	PAGE
Leather work, tooled leather — <i>Continued</i>	
relief work	D 329*, N 93-95*
filling with paste	N 95
Russia calf for	N 92
tools	D 323-324*, N 91*, 96*
tracing the design	N 87, 92
Leaves	
blue printing	A 361
giving off water	G 245
simple, compound and doubly compound	C 543*
Leek	
germination per cent.	G 233
Left overs	
utilizing	H 355
Legumes	
value as plant food	G 223
Lemon lily	
characteristics	G 333
Lemon tree, ponderosa	G 196
Lemons	
food value	H 255
preserving in water	H 357
removing stains with	H 359
Letter copying devices	B 418
Letter opener	
copper work	D 347*
Letter rack	
carving	C 112-117*
copper work	D 346-347*
two compartments, making and carving	C 109-112*
Lettering. <i>See</i> Gilding	
Letters. <i>See</i> Embroidery	
Lettuce	
cabbage lettuce.	G 306
cos lettuce	G 306
food value	H 255
going to seed	G 307
head lettuce.	G 306
planting seed	
depth to plant	G 42, 235
distance to plant	G 42
how to sow the seed.	G 95
indoor planting time	G 233
quantity to plant	G 36
time to plant	G 234
seed	
age for planting	G 34
germination per cent.	G 233
germination period	G 32
succession crops	G 307
transplanting	G 101

	PAGE
Lever	
arms	B 23*
double	B 25-27
lazy tongs	B 313*
principle of	B 21-28*
rule for power	B 63
Library tables. <i>See</i> Tables	
Lice	
cauliflower pests	G 289
chicken lice	A 148
powder receipt	A 149, K 201
plant lice	G 284
Life insurance	
advantages and disadvantages for saving	H 83
Lifting machinery. <i>See</i> Hoisting machinery	
Light	
ancient theory of	E 342
color dependent upon wave length	E 315
electro-magnetic theory	E 346
emission theory.	E 345
a form of vibration	E 343
theories held by eminent scientists	E 343-346
velocity	B 249-251, E 311
waves	E 310
length of	B 251, E 315
Lighting	
economizing bills	H 236
reading meters	H 238-240*
<i>See also</i> Electric lighting; Gas lighting	
Lightning	
arrester	E 292*
weather symbol	B 362
why lightning is seen before thunder is heard	B 249
Lilac	
characteristics	G 356
Lily	
red speciosum, planting and blooming time	G 179
white day lily	G 333
Lily-of-the-valley	
characteristics	G 365
false	G 345
Lima bean	
food value	H 255
planting	G 297
Lime	
disinfectant	H 212
protecting vines from insects	G 118
<i>See also</i> Soil	
Limerick darning	N 234
Limestone	
formation of	G 216

	PAGE
Limestone— <i>Continued</i>	
road material	G 85
Linden	
characteristics	C 560, G 367
Linen. <i>See</i> Doilies; Ironing; Table linen	
Linen chest	
making	C 377-380*
Lingerie hat	
eyelet work	N 169*
making and trimming	N 171-174
Links. <i>See</i> Chains; Cuff links	
Linoleum	
care of	H 191
Liquids	
boiling point	H 277
Living expenses. <i>See</i> Housekeeping	
Living-room	
furniture	D 50-53*
arrangement	D 61
Loam	
meaning of	G 220
Loaves and fishes: story	H 32
Lobster	
boiled	H 292
color	H 292
food value	H 254
Lock joints	C 255*
Lockjaw	
cause and prevention	B 248-249
Locks	
escutcheon plates, making	M 410-414*
<i>See also</i> Door hasp	
Locomotives	
boilers	B 117
link motion valve gear	B 317
Locust	
durability of black locust wood	C 494
varieties and characteristics	C 565, G 367
Log cabin	
woods for making	K 101
Lombardy poplar	G 353, 367
Looms. <i>See</i> Bead work; Weaving	
Loops for buttonholes	N 62*
Lotus, American	
characteristics	G 366
Luge-ing (Game)	K 371
Lumber and lumbering	
"boom"	C 520
clear lumber	C 499
curls or eyes, how made	A 443
cutting logs	K 100

	PAGE
Lumber and lumbering— <i>Continued</i>	
defects, detecting	C 524-530
drive	C 520
drying	C 495
estimating, problems in	C 504-509
kiln-dried	C 524, D 132-133
knot holes, how made	A 442
knots versus strength	C 497
length, standard	C 499
log jams	C 521
measuring	C 503
old method of sawing	C 136*
plain sawed	D 131*
quarter-sawed	D 131*
railroad consumption	C 517
saw mills	C 522
seasoning	C 524-525, D 132
shakes	C 530
shearing	C 496
shrinkage, principle of	C 528-530
thickness, standard	C 498
volume of business in United States	C 517
warping, principle of	C 527*
waste in cutting	C 512
waste in saw mills	C 522-523
winding lumber	C 531
<i>See also</i> Forestry; Trees; Wood	
Lumber rack	
making	C 152-154*
Luncheon: story	H 32

M

Macaroni	
food value	H 254
McCray, Arthur H.	
Profits of bee-keeping	A 333-336
Machine shop	
equipping to run by electric power	E 226, 229-231
Machinery. <i>See</i> Capstan; Engines; Gas and oil engines; Gasolene	
motors; Locomotives; Mechanical movements; Motorcycles;	
Sewing machines; Steam engine; Tools; Typewriters; Water	
wheels; Wheels; Windmills	
McIntyre, Flora	
How I earned two hundred dollars	A 331-333
Mackerel	
food value	H 253
Madeira embroidery. <i>See</i> Eyelet work	
Magazine cover	
tooled	N 94*
Magazine rack	
design	D 52*

	PAGE
Magazine rack, design — <i>Continued</i>	
and construction	D 165-170*
wood finish	D 237
Maggots	
garden pests	G 291
Magic lantern. <i>See</i> Stereopticon	
Magnesia	
cleaning properties	H 332
Magnet	
earth as a magnet	E 14
iron	E 13-14
poles	E 28*
steel, how to retain magnetism	E 28
<i>See also</i> Electro-magnet	
Magnetic field	E 13
about electric currents	E 353*
dynamo	E 9, 11-13
effect upon a magnet	E 353*
Magnetos. <i>See</i> Dynamos	
Mahogany	
imitation stain	C 489, D 230
Maids. <i>See</i> Servants	
Mallet	
carpenter's tool	C 200*
metal worker's tool	M 8*
Maltese cross	
drawing	C 27*
lace making pattern	N 233*
Mandrake. <i>See</i> May apple	
Mandrel	M 154*, 209
Manifolding devices	B 418, 421
Manures. <i>See</i> Fertilizers	
Maple	
box elder or ash-leaved maple	C 548
characteristics	C 544
moose wood.	C 548
mountain	C 548
Norway maple	G 367
qualities of	G 78
red or swamp maple	C 547, G 367
seeds, value of	A 47
silver, white, or soft maple	C 546
sugar or rock maple	C 545, G 367
sycamore	C 547
Maple sugar and syrup	
boiling down	A 75
bonbons	A 77-78
books about.	A 516
colors, changes in	A 75
food value	H 254
identifying trees	A 71

Maple sugar and syrup — *Continued*

proportion of syrup to sugar	A 76
sap	
care when running	A 73
ingredients	A 75
states that have sugar trees	A 69
straining	A 76
sugar making	C 546
equipment and preparation	A 72
Indian methods	A 69
primitive and modern methods.	A 70-71
tapping trees	A 72-74
testing when boiling	A 76
weather for making	A 74
Marathon race	
championship	K 371
Marble	
composition	G 216
Marbles	
first shot "fat"	K 346
names of	K 373
playing	K 372
reals	K 373
March	
birds	K 175
blooming plants	G 364
Marconi, Guglielmo	
inventor of wireless telegraph	E 316, 346
Marguerites	
bedding plants	G 324
Marigold	
African, characteristics	G 332
characteristics	G 330
good blooming plant	G 323
marsh marigold, characteristics	G 366
planting seeds	G 158
pot marigold, characteristics	G 329, 331
sowing and blossoming time	G 161
varieties	G 157
Marine engines. <i>See</i> Gasolene motors; Steam turbines	
Marketing	H 264-273
principles of buying	H 265
quantities, consideration of	H 272
staples, buying of	H 272
<i>See also</i> Names of articles, e. g., Fish; Meats; Vegetables; etc.,	
also Beef; Shad, etc.	
Markets in Venice	H 264
Marking	
bath towels	N 150*, 156
combination stitches	N 150-157*
cross stitch	N 156
emblems, bullion	N 154-156

	PAGE
Marking— <i>Continued</i>	
feather-stitching	N 156
French knots	N 150
ladder stitch	N 158-159
monograms	N 152-154
napkins	N 156, 157
outlining	N 150*
papier-mache letters	N 156
table and bed linen	N 157
Marquetry work.	C 328
Marsh rabbit.	A 509
Martha	H 382-387
Martin	
migration	K 176
Masonry. <i>See</i> Cement; Foundations; Retaining walls	
Match safe	
copper work	M 81-82*
Match scratchers	
drawing and making	C 38*
Matches	
invention of.	B 272
Mathematics	
woodwork mathematics	C 498-509
Mats	
corn husk for braiding	A 63
tooled leather, designs and process	D 328, 329*
woven rattan	N 247*, 249
<i>See also</i> Rugs	
Matt tool	
definition of.	M 210
Matting	
cleaning	H 131
Mattress	
making for doll-bed	N 50-52*
corn husks for	A 63
Maxim's, aero-curves	B 166-167*
Maxwell, James Clark	
scientist	E 341
May	
birds	K 175
blooming plants	G 365
May apple	A 23, G 345
Mayonnaise	
remedy for curdled	H 356
Meadow lark	
migration	K 176
Meadow mushroom	A 89
Meals	
clearing the table	H 176
effect of mental attitude during.	H 247
preparation	

PAGE

Meals, preparation — *Continued*

advance	H 308
sequence of work	H 305-308
serving	
courses	H 170
dessert course	H 172
duties of waitress	H 169-172
finger bowls	H 172
who to serve first	H 172
without a maid	H 174-176

Measures. *See* Weights and Measures

Meat

boiling whole	H 278
braising	H 280
broiling	H 275-276
buying principles	H 266
camp cooking	K 90
cooking, preparation for	H 285
cuts of	H 268*
food value	H 250
table	H 252
judging condition of	H 270
left overs	H 355
names of parts	H 267
roasting	H 282
stewing	H 280

See also Beef; Fish; Lamb; Mutton; Pork; Poultry; Veal

Mechanical drawing	C 23-39*
circles	C 28-30*
crosses	C 24-27*
curves	B 339
cylinder and cones	C 34*
design for filing cabinet	C 395-396*
for match scratcher	C 38*
ellipse	B 210-211*, C 19*, 112-114*
enlarging or reducing drawings	C 390, B 339
first lessons	C 24-30*
triangle, hexagon and star	C 29*

Mechanical drawing — Instruments

compass	
proportional compasses	B 339*
how to use	C 28-30
cyclograph for describing circular arcs	B 339*
drawing board	
how to use	C 23-25*
making	C 381-383*
drawing table, making	C 391-394*
irregular or French curves, making	C 387
making an outfit	C 381-398
pantagraph	
making	C 388-391*

	PAGE
Mechanical drawing — Instruments, pantagraph — <i>Continued</i>	
how to use	B 325*
section liners	C 387
T-square	
making	C 384-386*
to prevent warping	C 394
use of	C 24
triangles, constructing	C 386-388*
views and dimensions	C 32-34*
Mechanical movements	
anti-friction bearing	B 326*
balance, principle of	B 25
balance spring	B 330-331*
capstan	B 347*
centrifugal check hooks	B 326*
circular motion	
continuous	B 323*
intermittent	B 321-324*
variable.	B 321*
combination	B 327-328*
compasses	B 339
compound, definition	B 306
crank motion	B 312
cyclographs for describing circular arcs	B 339*
diagonal catch and hand gear	B 315, 316
disk-engine	B 334*
driving feed rolls	B 316*
endless bands	B 336*
feed motion	B 337*
fulcrum, principle of	B 21-28*
Geneva stop	B 319*
governor	
centrifugal	B 313*
engine	B 329
water wheel	B 314*
grinding or crushing	B 307-308*, 336*
gyroscope	B 334-335*
hyperbolas	B 338*
irregular motion	B 319-321*
lantern wheel	B 322*
lewis	B 347*
link-motion valve gear	B 317-318*
number of	B 307
oscillating engines	B 333-334*
pantagraph	B 325*
parabolas	B 338*
parallel motion	B 332-333*
parallel ruler, mechanism	B 331-332*
pendulums	B 329-330*
perpetual motion	
definition	B 306

	PAGE
Mechanical movements, perpetual motion — <i>Continued</i>	
impossibility of	E 234-237
pulleys	B 309-310*
ratchet wheel	B 322-324*
rectilinear motion	B 312*
releasing hook	B 326*
rollers, principle of	B 28
rolling contact	B 318*
rotary	B 312*
rotary engines	B 340*
intermittent	B 322*
simple, definition	B 306
speed, changing	B 328*
steering gear	B 346
stop and rotary motion	B 319*
toe and lifter	B 329*
tongs for lifting	B 348*
tread mills	B 337*
turbine, Jonval	B 341*
water wheels	B 341-344*
windmills	B 346*
weight, lever and fulcrum	B 23-28*
<i>See also</i> Mechanics; Pumps	
Mechanical powers. <i>See</i> Inclined plane; Lever; Mechanics; Pul-	
ley; Screw; Wedge; Wheel and axle	
Mechanical toys. <i>See</i> Toys	
Mechanics	
first mechanical power	B 21
problems in estimating mechanical power	B 82
progress of mechanical arts	B 271-277
six mechanical powers defined	B 63-64
<i>See also</i> Aeroplanes; Electric power; Engines; Gasolene motors;	
Inclined planes; Kites; Lever; Mechanical drawing; Mechan-	
ical movements; Perpetual motion; Power; Pulley; Pumps;	
Screw; Water wheel; Wedge; Wheel and axle	
Medicinal plants	
digitalis from foxglove	A 57
golden seal	A 57
pokeweed	A 58
weeds	G 272
Medicine cabinet	
making with paneled doors	C 354-357*
Melon	
origin	G 307
planting seed	
depth and distance	G 42
quantity to plant.	G 36
time to plant	G 234
seed	
age for planting	G 34
<i>See also</i> Muskmelon; Watermelon	

	PAGE
Mending and repairing. <i>See</i> Patching; Soldering	
Menus.	H 244-263
combinations and varieties	H 259-260
selection for ease in cooking	H 308
variety, essential	H 262
<i>See also</i> Diet; Food; Marketing	
Mercury vapor lamps	E 155-156*
Metal work	
alloys.	M 208
andirons, forging	M 363-370*
belt buckle, designs	M 195*
bending process	M 315
blotter pad, corners for	M 122-124*
bossing up	M 208, 419
bowl	
making	M 13*, 16-22*
Dutch bowls	M 77-79*
finger bowls	M 133-135*
brazing metals	M 310-315
chasing	M 209
coloring metals.	D 357
blue black	M 205
heating process	M 203
oxidizing silver	M 204
patina, imitation	M 202
solution for	M 204
violet	M 203
corners for chest	M 116
for desk pad	M 122-124*
decorative forgings, suggestions	D 364
metal work	M 410-419*
definitions of terms	M 208-211
designing patterns	M 13-14*
die making	M 206-208
door handles, making	M 406, 407, 416*, 417
door knockers	M 410-415*
door pulls	M 415*
drawer pulls	
designs	M 144*
making	M 417-419*
drawing process	M 315
embossing	M 30, 31
process	M 361
engraving process	M 361
escutcheon plate	M 412*
etching	M 362
eye bolt	M 415, 418
facets.	M 22*
oval	M 39
flux	M 209
forming process.	M 315

	PAGE
Metal work—Continued	
hammering	M 22*, 30, 39
handles	
cedar chest	M 116
crum scraper	M 136*
hinges	
cabinet	M 106*
cedar chest	M 116
copper or silver	M 100-106*
fine hinges	M 103*
riveting to box	M 114*
tube hinges	M 101-103*
binding tubes in place	M 105*
wings, making	M 104*
impressing	M 361
inlaying	M 362
lanterns	M 405-406*
letter openers	M 128*
lids	M 59*, 62*, 120, 139
lock plates	M 105, 116
molds	
making	M 27-28*
value of	M 31
pickling metals	M 210
planishing	M 210
processes other than smithing operations	M 361-363
repairing by brazing	M 314
repousse	
definition	M 210
design	M 30*
ring and ring post for box	M 120
riveting	M 73-77*
handles	M 88
iron tongs	M 288*
process	M 73, 76*
rivets, making	M 77
splitting iron or soft steel	M 362, 364-365*
tools for	M 5-15*, 208-211
trimmings	
for cedar chest	M 115-117*
for cigar box	M 115-117*
tubing for hinges, making	M 101-103*
twisting process	M 315
upsetting, definition	M 315
wire, reducing size of	M 101
<i>See also</i> Annealing; Blacksmithing; Brass work; Candlestick;	
Copper work; Enamel and Enameling; Fire tools; Forging;	
Iron work; Silver work; Soldering; Steel; Tempering; Tools;	
Welding	
Meteorology. <i>See</i> Barometer; Hail; Lightning; Rain; Thermome-	
ter; Weather	

	PAGE
Meter. <i>See</i> Ammeter; Electric-meters; Gas-meters; Voltmeter;	
Wattmeter	
Metric system	M 500-503
Mexican drawnwork	N 211*
Mice	
as pets	K 184
pests	H 361
Microbes	
tetanus	B 249
Mignonette	
annual	G 322
characteristics	G 330
choosing and planting	G 158
sowing and blossoming time	G 161
Mildew	
removing stains	H 359
Milk	
boiling point	H 277
book about	A 517
food value	H 250, 254
goat's milk, value	A 115
marketing	A 247
removing ink and rust stains with	H 359
testing for butter fat	A 243
sanitary and unsanitary methods of milking	A 245-247
Milking machine, Electric	E 54
Milkweed (Prickly lettuce)	
class and seed time	G 278
distribution of seed	G 273
Mimeograph	B 416
Minerals	
collecting	K 156
Mining machinery	
centrifugal check hook	B 326*
Mink	
breeding season	A 483
skin	
stretching	A 507
value	A 484, 506
skinning	A 507*
trapping	A 483-484
Minnows	
catching	K 132-133*
Mirrors. <i>See</i> Glass	
Mission furniture	
book case, making	C 352
clock case, making	C 277-278*
foot rests, making	C 374, 375*
library table, making	C 360-367*
making	C 361-376
plant stands, making	C 372-373*

PAGE

Mission furniture—*Continued*

tabourette, making	C 308-310*
tea table, making	C 367-372*
umbrella rack, making	C 375*
writing desk, design	C 375*
Mission oak finish	D 231
Mississippi River	
proposed dam across	B 246
Mitchell, Frank	
Success with chickens	A 163
Mitre box	
making and testing	C 228-231*
Mitred joints.	C 232-234*, 256*, D 143-146*
Model house. <i>See</i> Architecture	
Modeling. <i>See</i> Pottery	
Molasses	
food value	H 254
Mole	
fur	A 491
habits	A 489
trapping	A 489-491
Mollusks	
preserving specimen	A 374
Money. <i>See</i> Accounts; Allowances; Income	
Mongolian pheasants	A 197
Monogram	
embroidering	N 152-154
Monoplane	
construction of	B 171-173*
toy model, making	C 75-83*
Months	
lunar and calendar	B 214
Moon	
diameter	B 229
distance from earth	B 229
light, origin	B 214
orbit	B 216
phases	B 215*
rotation	B 216
<i>See also</i> Tides	
Moon flower	
characteristics	G 331
Moon vine	
value	G 359
Moore, D. McFarland	
inventor of Moore light	E 156*
Moore electric lamp	E 156*
Mops	
kinds and uses	H 141
Morels	
mushrooms	A 86

	PAGE
Morning glory	
characteristics	G 331
sowing and blossoming time	G 161
value	G 359
Morris, William	
rule for household possessions	H 115
Morris chair	
construction	D 188-193*
designs	D 50*, 189*
history of designs	D 188
wood finish	D 237
Morrison, Arthur	
budget of housekeeping expenses	H 78
Morse, Samuel Finley Breese	
inventor of the telegraph	E 60
Mortise and tenon joints	C 250*, 255*, 256*, 415
Mosquitoes	
book about	A 519
breeding places	A 474
enemies of	A 475, K 168
eradicating	A 473-475
protection from, in camping	K 70
Moss pink	
characteristics	G 364
Moths	
baiting	A 400-402, K 153-154
collecting and mounting	K 151-153
collecting time	A 388
development from the egg	A 393-395
how they come out of the cocoon	A 347
pests	H 362
<i>See also</i> Silkworm	
Motion. <i>See</i> Mechanical movements	
Motor boat. <i>See</i> Boat building; Gasolene motor; Launch	
Motor cycles	
engines	B 387-391*
Motors. <i>See</i> Aeroplanes; Automobiles; Dynamos; Electric motors;	
Engines; Gasolene motors; Locomotives; Steam engines;	
Vacuum cleaner; Water wheel	
Molding. <i>See</i> Metal work; Pottery	
Molds	
concrete block molds	B 243
concrete furniture molds	D 202
die making	M 206-208
metal work	M 27-28, 31
Mount Mellick stitch	N 143
Mountain climbing	
healthfulness of.	K 17
Mountains	
snow line	B 368

	PAGE
Mounting specimens. <i>See</i> Insects; Plants; Seaweed	
Mouse club	
membership	K 184
Movements. <i>See</i> Mechanical movements	
Moving toys. <i>See</i> Toys	
Muffins	
mixing ingredients	H 302
Mulberry leaves	
food for silkworms	A 337
Mullein, moth	
class and seed time	G 278
habits and characteristics.	G 347
Mumblety peg	K 374
Mushrooms	
book about	A 516
chanterelles, identifying	A 89
cooking	A 84, 87
coprinus comatus	A 90
coral fungi	
cooking	A 87
identifying	A 86
edible varieties	A 83*, 85-92
food value	H 255
inky caps, identifying	A 90
meadow mushrooms	A 89
morels, identifying and gathering	A 86*
oyster mushrooms, identifying	A 91
propagation	A 88
puff balls	
cooking	A 84
identifying	A 83-84, 87-89
varieties	A 88-89
shaggy manes	A 90
where to get information about	A 91
Music	
transmitted by telephone	E 295
Musical instruments. <i>See</i> Organ; Piano; Pipe organ; Telharmonium	
Musk	
characteristics	G 331
Muskmelon	
American, outdoor planting	G 308
English, how grown	G 307-308
food value	H 255
indoor planting time	G 233
seeds, germination per cent.	G 233
Muskrat	
book about	A 519
food	A 509
fur, value	A 491
houses	A 503
river trapping	A 504

	PAGE
Muskrat — <i>Continued</i>	
setting and baiting traps	A 504
skinning	A 507*
skins, value	A 506
swamp trapping	A 503
trapping	A 492
season	A 504
Mustard, wild	
class and seed time	G 278
Mutton	
cuts and their uses	H 270
food value, table	H 253
My heritage	H 63-68
Myrtle	
characteristics	G 365
N	
Nail puller	
making	M 353*
Nails	
boxes for, making	C 206-209*
cabinet for, making	C 209-212*
driving into plaster walls	C 246
holding power	B 46-47
sinking nails	C 208*
Napkin	
marking	N 157
<i>See also</i> Table linen	
Napkin rings	
silver or copper work	M 191-192*
Naphtha	
cleaning properties	H 332
Narcissus	
easy to grow	G 166
poets narcissus, planting and blooming time	G 177
varieties distinguished	G 169
water bulbs	G 168, 175
Nasturtium	
characteristics	G 323, 328, 329, 332
dwarf, characteristics	G 332
planting	G 83, 156
Natural resources	
conservation	A 92-94
by specimen collectors	A 362
Nature study	
keeping a diary	K 148-149
making a beginning	K 144-150
methods	K 150
mineral collections	K 156
practical side	K 167

	PAGE
Nature study— <i>Continued</i>	
water life	K 158-167
water telescope	K 159
<i>See also</i> Insects; Plants; Shells; Silkworm	
Necklace	
silver work	M 166-170*
Neckties. <i>See</i> Ties	
Needham, John	
Reclaiming a spring	A 280-282
Needlecase	
making	N 46-47*
Needlecraft. <i>See</i> Basket making; Bead work; Braiding; Crochet- ing; Drawnwork; Dressmaking; Embroidery; Irish crochet; Knitting; Lace making; Leather work; Sewing	
Nemophila	
characteristics	G 331
Nernst lamp	E 157
Nets	
butterfly net	K 151*
collector's net for water specimen	K 158*
making, for insect collecting	A 376-378
Newspapers	
cleaning lamps with	H 138
polishing glass with	H 134
Newton, Sir Isaac	
corpuscular theory of light	E 344
theory of tides	B 217-218
Newts	
taming	A 266
Nigger baby (Game)	K 381
Nile River	
dam across	B 247
Nitrates	
plant food	G 10, 221, 223
for sandy soil	G 224
Norfolk Island pine.	G 196
Norway pine. <i>See</i> Pine—red	
Notched joints	C 255*
Notched trophy stick	C 11*
Nut hatch .	
insect destroyer	A 456
Nutrition. <i>See</i> Diet; Food	
Nuts	
beech nuts	A 37-39
book about	A 516
chinquapins	A 32
food value	H 255
grading for market	A 42
growing	A 43-46
from seeds	A 46
hazel nuts	A 33-35

	PAGE
<i>Nuts—Continued</i>	
hickory nuts	A 39
pecans	A 40-43
pine nuts	A 29
tree seeds	A 46
care of	A 48
use of	A 46
walnuts	A 35-37
<i>Nuts (Iron)</i>	
forging	M 244-246*
O	
<i>Oak</i>	
antique, stain for	C 489
black jack or barren oak, characteristics	C 554
black or yellow, characteristics	C 554
chestnut oak, characteristics	C 552
durability of wood	C 494
Flemish oak stain	D 231
forest green oak finish	D 232
fuming	D 233-234
golden oak finish	D 229
gray oak stain	D 232
laurel oak, characteristics	C 555
live oak, characteristics	G 367
mission oak finish	D 231
mossy-cup or bur oak, characteristics	C 551
oak gall	K 147
pin oak, characteristics	C 553, G 367
post or iron oak, characteristics	C 552
quality of	G 79
quarter-sawed	C 551*, D 131-132
red, characteristics	C 552
scarlet, characteristics	C 553
stains, list of	C 482
swamp white oak, characteristics	C 552
weathered oak stain	D 233
white, characteristics	C 549-551
willow oak, characteristics	C 554
<i>Oats</i>	
depth to plant seeds	G 235
<i>Obelisks</i>	
moving	B 56-57
<i>Occupations</i>	
berry picking	A 8-13
best ways of earning money	A 3-6
birds, attracting	A 455-461
carriage cleaning	A 408
character building	A 6-7
choosing	A 6

	PAGE
Occupations — <i>Continued</i>	
cider vinegar, making	A 412-417
collecting Christmas greens	A 50-57
collecting insects	A 374-403
collecting plants	A 94-99, 349-374
collecting tree seeds	A 46-50
collecting useful plants, flowers, grasses, etc.	A 57-69
collecting wood for rustic furniture.	A 410
corn, drying.	A 427-428
corn, selecting seed	A 410-412*
fall work, list of	A 5
forest fires, preventing	A 467-468
game preserve, creating	A 464-467
grape juice making	A 417-421
harvesting nature's crops	A 8-99
keeping bees	A 237-336
kindling wood, gathering	A 404-408
lavender sticks, making	A 424
leaf mold, making	A 421-424
making brooks and springs useful	A 271-286
maple sugar making	A 69-78
mosquitoes and flies, exterminating.	A 473-478
mushroom gathering	A 83-94
nuts, gathering and growing	A 29-45
odd jobs	A 404-448
orchard work	A 409*
outdoor worker's library	A 516-519
raising animals for pets	A 203-240
raising domestic animals	A 100-202
silkworms, raising	A 337-348
snow shoveling	A 431-432
spring work, list of	A 6
summer work, list of	A 5
tennis court, making	A 428-431
training animals	A 241-270
trapping	A 478-512
weeds, killing	A 469-473
wild fruit, gathering	A 14-29
winter work, list of	A 5
year-round, list of	A 6
<i>See also</i> Housekeeping	
Ocean. <i>See</i> Tides	
Odd jobs	A 404-448
Oersted, Hans Christian	
discovery of magnetic action of currents.	E 14
discoverer of magnetic field about an electric current	E 353
Ohm, George Simon	
Ohm's law	E 92-93
Oil cloth as a floor covering	H 191
Oil engines. <i>See</i> Gas and oil engines	

	PAGE
Oil furnace	
heating steel in	M 290
Oil lamp. <i>See</i> Lamp, oil	
Oil nut. <i>See</i> Butternut	
Oilstone	
sharpening tools	C 183*
Okra	
germination per cent.	G 233
Olympic games	
events contested for	K 372
One old cat (Game)	K 375
Onion	
food value	H 255
indoor planting time	G 233
insect pests	G 291
peeling	H 294
planting seed	
depth and distance to plant	G 42
quantity to plant.	G 36
time to plant	G 234
planting sets and seed	G 309-310
seed	
age for planting	G 34
germination per cent.	G 233
germination period	G 32
soil for	G 23, 309
Open air life. <i>See</i> Outdoor life	
Opening the house. <i>See</i> Housekeeping	
Opossum	
bait for	A 509
skin, value	A 509
Orange	
food value	H 255
Orange root	G 348, 365
Orchard. <i>See</i> Fruit trees	
Organ	
electric	E 55, 278-279*
pipe organ	E 44-52
telharmonium	E 293-295
Oriental rug	
washing	A 447
Oriole	
insect eater	A 457
migration	K 176
Ornithoptere flying machine	B 163
Osage orange	
hedge shrub	G 357
Osmium lamp	
metal filament	E 145
Oswego tea	G 333, 347
Outdoor furniture. <i>See</i> Furniture	

Outdoor games. *See* Games

Outdoor life

sleeping outdoors A 6-9, 52*
value of K 6

See also Camping

Outdoor sports. *See* Sports

Outdoor work

free printed matter, how to obtain. A 513-516
occupations suited to the four seasons. A 5
odd jobs A 404-448

See also Occupations

Outlining. *See* Marking

Ovens

camp ovens K 80-82*
clay K 81
dampers for regulating H 229
Dutch K 81
electric E 305-308
reflector K 80, 81*
temperature for baking and roasting H 282, 283

Owl

as a pet K 184

Oxen

trained oxen, value of A 258-259

Oyster

broiling H 275-276
cleaning H 291
food value H 253
opening H 290
testing H 291

Oyster mushroom A 91

P

Packing

books. H 349
fixtures H 348-349
furs and woolens H 347
textile furnishings H 348

Paint

cleaning woodwork. H 122, 124, 134
removing stains H 359
stenciling N 81-82

Painting (Mechanical)

brushes H 342
mixing paints H 342
preparing surface H 341
summer house C 424

Palms

care of G 198
varieties to grow G 198

	PAGE
Panama canal	
cement used for	B 246
Pandanus	
window box plant	G 193
Pansy	
care of bed	G 318
characteristics	G 329, 331
picking flowers	G 319
planting seeds	G 318
to prevent running out	G 319
tufted, characteristics	G 334
Pantagraph	B 325*
making	C 389*
Pantry	
arrangement.	H 177
plan in model house	D 12
<i>See also</i> Dish washing	
Paper hanging	
applying paste	H 345
matching and cutting	H 344
putting on paper	H 345
quantity of paper required	H 343
removing old paper	H 344
Paper knife	
carving designs	C 122*
copper work	D 347*, M 34-38*, 126-128*
whittling.	C 121-123*
Papier-mache letters for marking.	N 156
Par (Game)	K 347
Parabolas	
describing	B 338*
Parasites	
eggplant pests	G 305
Paris green	
insecticide	G 282, 285, 288, 290, 292
rule for mixing	G 130
Paris sewers	
described by Victor Hugo	H 216
Parsley	G 310
planting seed	
depth to plant	G 42, 235
distance to plant	G 42
in a box	G 164
quantity to plant.	G 36
time to plant	G 234
seed	
age for planting	G 34
germination per cent.	G 233
Parsnips	
food value	H 255
planting seed	G 310

	PAGE
Parsnips, planting seed — <i>Continued</i>	
time to plant	G 234
wild parsnips, class and seed time	G 278
Partridge	
migration	K 176
Pass it (Game)	K 375
Passe partout	D 72-78*
color scheme	D 73-74
materials and tools	D 75
process	D 75-78*
Paste	
receipt	H 346
for leather work	N 88, 95, 96
Pastry	
filling pies	H 304
juices, to prevent boiling over	H 305
mixing the dough	H 303, 304
soggy crust, preventing	H 304
Patching	
square patch	N 33-35*
Patents	
applying for	B 200-201, 205
Canadian	B 207
caveat, provisional protection	B 206
drawings and specifications	B 202-205
duration	B 205
fees for application	B 205, 206
in a foreign country	B 208
re-issuing	B 205
time required to procure	B 205
what granted for	B 206
Patterns. <i>See</i> Embroidery; Dressmaking; Stenciling	
Peach trees	
care of seeds for planting	A 48
distance to plant trees	G 258
Peacock	
care and feeding of young chicks	A 186
habits of the hen	A 186
Indian peacock, value	A 187
raising	A 185-188
acquiring information about	A 187
Peanuts	
food value	H 256
Pear	
distance to plant trees	G 258
food value	H 255
Peas	
food value	H 250, 255
insect pests	G 291
planting seed	G 311
quantity to plant.	G 36

	PAGE
Peas, planting seed — <i>Continued</i>	
time to plant	G 234
seed	
age for planting	G 34
germination per cent.	G 33, 233
germination period	G 32
Peasants	
German embroidery work	N 196
Russian applique work	N 198
Pecan	
commercial value	A 42, 43
cultivating	A 40-41
gathering	A 41-42
grading	A 42-43
polishing for market	A 43
Peen of hammer. <i>See</i> Hammer	
Pelota (Game)	K 376
Pelts. <i>See</i> Skins	
Pen rack	
design and making	C 117-119*
Pen tray	
gouge work	C 259*, 263*
Pen wiper	
tooled leather	D 329-330*
Pencil box	
making and carving	C 106-108*
Pencil sharpener	
drawing and making	C 38*
Pendulum	
compound bar, compensation pendulum	B 330*
mercurial compensation pendulum	B 329*
Pennant	
yacht pennant	B 107
Peony	
annuals	G 316
arrangement in the garden	G 321
Chinese, characteristics	G 335, 365
depth to plant	G 321
European, characteristics	G 335
garden, characteristics	G 365
planting and blooming time	G 179
Pepper	
indoor planting time	G 233
planting and transplanting	G 311-312
planting seed	
depth and distance to plant	G 42
quantity to plant	G 36
time to plant	G 234
seed	
age for planting	G 34
germination per cent.	G 233

	PAGE
Pepper, seed — <i>Continued</i>	
germination period	G 32
stuffing, varieties for	G 312
varieties	G 312
Pepper bush, sweet	
characteristics	G 356
Perennials	
definition of	G 160
for cut flowers: table	G 333
fragrant: table	G 333
low: table	G 334
medium height: table	G 335
tall: table	G 334
value of	G 316
Pergola	
designing and building	C 425-440*
Perpetual motion	B 306
impossibility of	E 234-237
Persimmons	
picking	A 23
region grown	A 22
Pests. <i>See</i> Household pests; Insect pests; Mice; Rats	
Pets	
book about	A 517
care of	K 170-192
housing	C 451-456*, K 186
ornamental land and water fowl	K 180-182
raising	A 203-240
story of a boy's animal cage	A 233-235
taming wild animals	K 186
trained, market value	A 248
<i>See also</i> Bantams; Birds; Cats; Cavies; Crows; Dogs; Ducks; Gold Fish; Guinea pigs; Mice; Pigeons; Poultry; Rabbits; Raccoon; Shetland pony; Squirrels	
Petunia	
characteristics	G 329
good bloomers	G 323
sowing and blossoming time	G 161
Pheasant	
book about	A 517
breeds	A 197
coops and rearing ground	A 200-201
eggs, packing	A 199
feeding young chicks	A 200
localities in United States for raising	A 198
migration	K 176
protection from birds of prey	A 202
raising	A 196-202
care of mother	A 199
in England.	A 199
serving in German fashion	A 197

	PAGE
Pheasant— <i>Continued</i>	
varieties	K 181
<i>See also</i> Guinea fowl	
Phlox	
characteristics	G 330, 331, 332, 365
late, characteristics	G 335
sowing and blossoming time	G 161
Phœbe bird	
insect destroyers	A 457
migration	K 175
Phosphates	
plant food	G 10, 221, 224
Photography	K 301-317
action of chemical waves	E 336
cameras, kinds and cost	K 303-304
dark room	K 309
developers and developing	K 313-315
exposure	K 312
fixing bath	K 314, 315
focusing	K 311-312
lens, importance of	K 307
negatives, preserving	K 316
plates versus films	K 308
printing papers	K 315
snap shots, taking	K 305-307
snap shots versus real photography	K 302
subjects, choosing	K 310
Piano, Electric	E 54
Pickereel weed	
characteristics	G 366
Pickles	
walnuts	A 37
Pickling metals	
definition	M 210
Picks (tools)	
forging stone picks	M 344*
Picnic tables and benches	
making	B 132-134
Picture frames and framing	
carbon photographs of a masterpiece, framing	D 69-72
carving designs	C 101, 102, 130-132
colonial interiors in colors, framing	D 68
gluing mitred joints	D 144-146*
joints	
kind required	D 147
mitred	D 143-144*, C 232-234*
large photographic reproduction, framing	D 148
palette photograph frame	C 131
passe partout	D 72-78*
rabbeting	C 232*
selecting	D 67

	PAGE
Picture frames and framing— <i>Continued</i>	
shrinkage	D 146
silver work	M 185-186*
staining	D 69, 71
stock, securing	D 142-143*
whittling back for	C 131
whittling out of solid piece	C 19-22*
Pictures	D 64-80*
cleaning	H 135
decorative value	D 64
grouping and hanging	D 66-67
hanging correctly	D 79*
considering space values	D 64-65
height to hang	D 80
hooks and wires	D 78-80
Japanese way of hanging	D 65-66
Piers	
foundation walls	B 19
filling space between	B 76
Pies. <i>See</i> Pastry	
Pig. <i>See</i> Swine	
Pig iron	M 230
Pig pen. <i>See</i> Swine	
Pig weed	
class and seed time	G 278
Pigeon holes. <i>See</i> Filing cabinet	
Pigeons	
breeds	A 208, K178
prize winners	K 179
carrier pigeons	K 180
characteristics	A 207
common, care of	K 179
devotion of male	A 211
dove cote	A 208-209
care of	A 215
for fancy breeding	K 179
sanitary provisions	A 213
dragoons	K 178
fancy pigeons for pets	A 207-217
feeding	A 214, K 179
fly made of wire	A 212*
market value	K 179
nest building	A 210
nest dishes	A 210, 211
nesting compartment, building	A 209-210
net for capturing	A 209*
perches, making	A 210
pests, guarding against	A 209
pouter	K 178
roosts, making	A 210*
rufflenecks (Jacobins)	K 178

	PAGE
Pigeons— <i>Continued</i>	
tumblers, characteristics	A 208, K 178
water bath	A 214
white fan tail, model	K 178
<i>See also</i> Squabs	
Pile driving machine	
releasing hook	B 326*
Pillow	
bead work	N 293
choosing cushion covers	D 97
cornhusks for filling cushions	A 63
fraternity pillow	N 376
lingerie pillow	N 375
making for doll-bed	N 52
<i>See also</i> Block printing; Stenciling	
Pillow case	
making for doll-bed	N 53*
marking	N 157
Pillow shams	
fastening	H 152
Pin	
insect pins	A 380
metal work tool	M 210
Pin case	
making	N 56*
Pin cushion	
embroidered	N 193-196
Pin tray	
gouge work	C 264*
Pine	
cones, gathering and storing	A 49
Georgia pine, characteristics	C 535
long leaf	A 55
pitch pine, characteristics	C 536
red, characteristics	C 536
white	
characteristics	C 535
strength	C 496
white pine seeds	
gathering and curing	A 48-49
marketing	A 49
yellow, characteristics	C 536
Pine needles. <i>See</i> Balsam	
Pine nuts	
gathering	A 29
Pink	
characteristics	G 329
fringed, characteristics	G 333
moss pink, characteristics	G 364
Pioneer life	
"goin' plummin'"	A 26-29

	PAGE
Pipe organ	
operating by electricity	E 44-52
Pipes. <i>See</i> Plumbing; Soldering; Stove pipe; Waste pipes	
Pistil	
seed making function	G 247
Pistons	
mechanism of	B 315-316*
Pitch block	
definition of.	M 210
Pitch fork	
forging	M 239*
Pitcher plant	
characteristics	G 366
Plackets. <i>See</i> Dressmaking	
Plaited skirts. <i>See</i> Dressmaking	
Plane. <i>See</i> Inclined plane	
Planes and planing	
adjusting planes	C 177
block plane	C 176, 178
cap iron, adjustment and use	C 184*
jack plane	C 178
operation of the plane	C 146, 178-179, D 133-134, 136
sharpening plane irons	C 179-184*
smooth plane	C 177*
use of shooting board	C 106*
wooden and iron	C 176*
Planishing	
definition of.	M 210
Plant breeding	
budding	G 251-254
improving seeds	G 246-248
layering	G 249-251
methods	G 249
mongrel varieties from close planting	G 105, 145
seed selection	G 225-233
slipping	G 188-190
topping	G 199, 250-251
Plant food	G 221-226
chemicals essential for	G 221
how plants feed	G 225
nitrogen	G 10, 221
for sandy soil	G 224
source of	G 223
phosphorus	G 10, 221, 224
potash	G 10, 221, 224
source and value of	G 10
Plant stands	
jardiniere of wood	G 68-71*
mission style, making	C 372-373*
stool making	G 53-55*

	PAGE
Plantain	
rib-grass, class and seed time	G 278
seed production	G 274
Planting tables. See Flower gardening; Seeds; Shrubs; Vegetable gardening	
Plants	
action of chemical waves	E 336
books about	A 518
effect of light	G 242
essential parts	G 240
food manufactured and stored by	G 242-245
herbaceous plants, definition	G 317
honey or pollen plants	A 322
leaves	
food factory	G 242-245
functions	G 240
lice, destroying	G 284, 291, 293
life history	G 239-248
making wooden labels for	G 58*
medicinal plants	A 57
root-system	G 240-241
stems, passage way	G 241
studying	A 349-369
transplanting	G 118, 268-270
from coldframe	G 101-102
useful to attract birds and protect trees	A 461
See also Flower gardening; Flowers; Gardening; Insect pests; Plant breeding; Plant food; Salad plants; Seeds; Vegetable gardening; Vegetables; also names of plants	
Plants — Collection and preservation	A 349-363
arranging specimens	A 352-353
blue printing	A 360-362
classifying specimens	A 356-359
drying specimens	A 353
labeling specimens	A 356, K 156
marketing collection	A 360
mounting specimens	A 353-356, K 155
outfit for	A 352
preserving in covers	A 356
reasons for collecting	A 349-350, 360
representing different stages of growth	A 359-360
rules of the game	A 362
seaweed	A 362-374
Play	
importance of	K 4-5
Playhouse	H 3-40
in flats and apartments	H 8
in garret.	H 5
in a tree.	H 3
make believe	H 8, 13

	PAGE
Playthings	
make believe	H 11-12
<i>See also</i> Toys	
Pleurisy root	G 348, 365
Pliers	
carpenter's tool	C 199*
metal worker's tool	M 6*
Plug in the ring (Game)	K 376
Plum	
care of seeds for planting	A 48
distance to plant trees	G 258
origin and distribution of wild plums	A 24
value of trees in chicken yards	K 204
Plumb-line	
home-made device	G 114
Plumbing	H 213-223
care of, in closed houses	H 348
importance of	H 219
leaks, peppermint test	B 254
location of pipes for housekeeper	H 216
principle of the U	H 216-218*
taps, repairing	B 255
traps, construction and care	H 217-218
ventilation pipes	H 319
<i>See also</i> Soldering; Waste pipes	
Pocket book. <i>See</i> Purse	
Point lace. <i>See</i> Lace making	
Poison Ivy	
destroying	A 472-473
Poisoning. <i>See</i> Lockjaw	
Poker	
making fire tools	M 371*
Pokeweed	
roots and berries	A 58
shoots as food	A 58
Polish and polishing	
French polish	C 490
wax polish	C 490
<i>See also</i> Brass work; Copper work; Enamel; Floors; Furni- ture; Glass; Metal work	
Pollination of plants	G 247
corn growing	G 145
Polo	
equestrian	K 377
hand polo	K 356
water polo	K 392
wicket polo	K 393
Pompey's pillar	B 57
Pond making in a city back yard	G 134-136
Ponderosa	
indoor plant	G 196

	PAGE
Pony as a pet	A 203-205
Poplar	
Carolina	G 367
characteristics	C 563
for landscape gardening	G 353
quick growers	G 79
Popp-mallow	
characteristics	G 334
Poppy	
characteristics	G 328, 331
depth to plant seeds	G 235
Iceland, sowing and blossoming time	G 161
in England	G 271
Oriental, characteristics	G 335
planting	G 84, 158
plume, characteristics	G 334
self-sowing	G 316
transplanting	G 156
Porcupine quills	
how to procure	A 68
uses	A 69
Pork	
cuts and their uses	H 270
food value	H 253
combined with vegetables	H 259
used as chicken	H 358
Porterhouse steak	H 269
Portieres	
bead work	N 290-293
stenciling	N 81
weaving designs	D 260-261
<i>See also</i> Block printing	
Portland cement	
origin and uses	B 246-248
Portulaca	
blooming plants	G 323
characteristics	G 328
Posts	
preserving underground	C 402
<i>See also</i> Foundations	
Pot rest	G 68-71*
Pot roast	H 268
Potash	
plant food	G 10, 221, 224
Potato	
boiled or baked	H 280
food value	H 255
insect pests	G 287, 292
planting seed potatoes	G 129
cutting device	A 437-439*

	PAGE
Potato, planting seed potatoes— <i>Continued</i>	
depth and distance to plant	G 42
quantity to plant	G 36
profit from raising	G 130
spraying	G 130
soil for	G 129
Potato race	K 378
Pots and pans	
care of	H 198, 201
materials	H 201
soldering	M 43-45
Potted plants. <i>See</i> Flower gardening	
Pottery	D 280-320*
bat and how made	D 286
"bisque," meaning	D 301
bowl	
decorating	D 294-299*
designing and modeling	D 287-294*
candlestick, designing	D 313-315*
clay, selecting	D 284
coiling method	D 283, 291*
concrete pottery	D 207-209*
decoration	
applying the design	D 297-298
classes	D 295-297*
color combinations	D 303-304
methods	D 294
modeling a decoration	D 298
under-glazing	D 298-299
designing	D 288-290*
avoiding natural forms	D 290
testing profiles	D 290*
development of	D 280-281
fern dish	D 310-313*
firing	D 299-301
glazed pottery	D 306
glazes, matt and bright glaze mixes	D 303
glazing	D 301-307*
grinding the glaze	D 302
"gro" making	D 316
handles, making	D 309*
kiln, portable	D 300*
materials and tools	D 284-287*
template	D 292*
modeling process	D 290-292*
potter's wheel versus hand method	D 282-283
scientific principle of	D 281
scraping	D 293*
"slip," meaning	D 294
testing work	D 292*
tiles for tea plate and fireplace	D 315-320*

	PAGE
Pottery— <i>Continued</i>	
tools	D 285-287
vases, designing and decorating	D 307-310*
Poultry	A 132-178, K 193-207
accounts, how to keep	A 153, 157, 168, 172
acquiring information	A 187
amateur's experience with	A 166-168
American breeds	K 195
Asiatic breed	K 195
Bantams, breeding and care	A 217-218
books about	A 517
Brahmas	K 195
breeding pure stock	A 156
purpose of	K 177
breeds, characteristics	A 220-222, K 194-195
broilers, raising	K 195
fattening for market	A 152-153
brooders, making	A 175, K 199
broody hens, curing	A 144
business methods in poultry raising	A 153-159
care and housing	A 133-143, K 193-207
city experiment with	A 159
cleanliness	A 142-143, 146
clipping wings	K 207
Cochins	K 195
cooking	
broiling	H 275-276
preparation for	H 285-288
coops, model	A 147-151*
crested variety, care of	A 222
drawing poultry	H 287
dust bath for	A 141*, K 206
eggs	
best layers	K 195
cost of, for settings	K 196
effect of feeding on layers	A 171
keeping a record for idlers	A 157*
of fancy fowls	A 221
quality affected by feed	A 146
selections for settings	A 148
testing layers	A 154-155*
winter laying	K 205-206
exercise, provisions for	A 138, 146
expenses of one experiment	A 176
experiments	A 159-177
fancy breeds and their care	A 219-222, K 194-195
fattening broilers for market	A 152, 153
feathers, marketing	A 159
food value table	H 253
fruit trees in the chicken yard	K 204
Hamburgs, characteristics	A 220

Poultry—*Continued*

PAGE

hatching	
average number from a setting	K 196
time required for eggs to hatch	A 148, K 198, 201
hen gate.	A 158*
Houdans, characteristics	A 220
incubators	A 175
average time for eggs to hatch	K 198, 199
operating	K 197-199
killing	H 286
Lakenvelders, characteristics	A 220
Langshans	K 195
Laying hens. <i>See</i> Poultry, eggs	
Leghorns.	K 195
eggs	A 221
in a prize contest	A 160-163
lice	
on small chicks	A 148, K 201
preventing	A 143
marketing	A 156-159
Mediterranean breeds	K 195
molting season	A 145
nests for sitting hens	A 147
non-sitters	K 195
ornamental land and water fowl as pets	K 180-182
cost of	K 181
Orpingtons, record price	K 194
plucking	H 286
Plymouth rocks	K 195
Polish varieties	A 220
prize contests, stories of	A 160-164
prize-winning Orpingtons	K 194
profit in	K 193
ranging versus housing	A 134
runs, cornfields for	A 176
selection of, for cooking	H 271
shows, purpose of	K 177
sitting hens	
coops for	A 147-148*, 150
feeding	A 144
nests for	A 147
raising	K 200-201
starting a business with eggs versus chickens	K 195-196
stories of success in raising	A 159-177
thoroughbreds versus mongrels	K 194
training for poultry raising	A 173
trap nests for testing layers	A 154-155*
white Wyandotte	A 168-172, K 195
wild fowl, clipping wings	K 81
winter care	K 205-206
young chicks, care of	K 202-203, A 147-153

	PAGE
Poultry— <i>Continued</i>	
Yokohamas	A 220
See also Ducks; Game and game birds; Geese; Guinea fowl; Peacock; Poultry feeding; Poultry houses; Turkey	
Poultry feeding	
effect on quality of eggs	A 146
feeding six thousand hens in one half hour	A 164-166
growing feed	A 153
making hens lay	A 171
molting season	A 145
rack for feed pans, to prevent waste	A 145*
regularity essential.	A 146
self-feed grain box	A 139*
self-feed grit box	A 136*
sitting hens	A 144
trough for feed, making	C 450*
winter feeding	K 206
young chicks	A 150-153, K 199
Poultry houses	
building a poultry house	A 132-143*, C 441-450*, K 204*
cleaning provisions	A 140, K 204
construction principles	A 135, C 441-442
coops	A 147-150*
corners, finishing	C 446*
curtained shed	A 138
doors and windows	A 137*, C 448
dropping board	A 140, C 449
dust bath	A 141*, K 206
floors, cement	A 137
foundation	C 443-444
frame for window screen	C 449
framework of the house	C 444-445*
for an eleven dollar house	A 133*
furnishings	A 139-142*, K 204*
heat, planning for	A 135
location	A 135, K 207
materials.	A 136-137
nests, location	A 140-141, K 204
roofing paper	C 449
roosts, making	A 139, C 450, K 204
runs	A 141, 142, C 450, K 204
sanitary principles	A 142-143, 146
scratching shed	A 138, K 204, 205
siding for frame	C 445
sleeping room	K 204
working drawings	C 443, 447
Powell. See Baden-Powell, Sir Robert	
Power	
dynamometer for measuring	B 324*
foot pound	B 123
problems in estimating	B 82

Power—Continued**PAGE**

- steam versus electricity E 3-5
- units of power B 122-125
- See also* Electric power; Gasolene motors; Mechanics; Steam;
- Water power
- Precious stones
 - bezel setting M 152-157*, 163*, 176
 - cutting metal away for setting M 157-159*
 - prong setting M 159-161*
 - selecting for rings M 152
- Preserves
 - storing in cellar H 211
 - See also* Canning; Jam; Jelly
- Press copying methods B 418
- Pressing skirts N 73
- Prime roasts H 269
- Printing
 - block printing D 98-106
- Prisoner's base K 378
- Propeller. *See* Aeroplanes; Screw propeller
- Proteins
 - effect of boiling H 277
 - effect of cold water H 278
 - food composition H 248
 - foods containing H 250
 - proportion in diet H 249, 252
- Proverbs
 - Indian proverb about home making H 44
- Pruning
 - hazel bushes A 35
 - methods A 439-443*
- Puff balls A 83-84, 87-89
- Pulleys
 - chain B 322*
 - dynamometer B 324*
 - endless chain B 310
 - expanding B 321*
 - mechanical principle of B 49-52*
 - movable, theory of B 50-51*
 - multiple B 51-52*
 - rule for power B 63, 310
 - snatch block B 50*
 - Spanish bartons B 310*
 - triangular eccentric B 311*
 - use of B 43*
 - White's pulley B 310*
- Pumpkin
 - planting G 312
 - depth and distance to plant G 42
 - quantity of seed to plant G 36
 - time to plant G 234

	PAGE
Pumpkin, planting — <i>Continued</i>	
with corn	G 117
seed	
age for planting	G 34
germination per cent.	G 233
striped beetle pests	G 117
Pumps	
action of.	B 235-236
Archimedes screw	B 143-145*, 344
double acting	B 346*
force pumps.	B 236, 345
lift pumps	B 236, 345*
plunger pump for vacuum cleaner	B 379-381*
theory of	B 234-235
<i>See also</i> Windmills	
Punch (Tool)	
centre punch, making	M 297*
metal work tool	M 7*
Pupa. <i>See</i> Insects	
Puppy. <i>See</i> Dogs	
Purdy, Carl	
collecting and growing California bulbs	A 94-99
Purling	N 353*
Purse	
bead work	N 285-290*
tooled leather, making	D 340-342*
<i>See also</i> Card case	
Purslane (Pursley)	
class and seed time	G 278
Push ball	K 379
Push button. <i>See</i> Electric push button	
Pyramids of Egypt	
how they were built	B 54-56
Pyrography	
outfit	C 330-331
woods suitable for	C 240, 330
Pyrometric cones	D 300*

Q

Quail. <i>See</i> Bob white	
Quaker ladies	G 341
Quarter sawed oak	C 551, D 131-132*
Queen Anne's lace	G 349
Quills, porcupine	A 68
Quoits	K 379

R

Rabbeted joints	C 255*
Rabbit	
bait	A 508

	PAGE
Rabbit— <i>Continued</i>	
breeds, common and fancy	K 182, A 498
care of	K 185
characteristics	A 497
enemies	A 498
fur, value	A 501
house, construction	C 451-454*, K 182-183*
hunting	A 500
raising for pets	A 206
snares, making	A 500
story of a boy's animal cage	A 234
Raccoon	
bait for	A 509
habits	A 268
skin, value	A 509
story of a boy's animal cage	A 234
taming	A 268-269
Racing	
feather race	K 347
marathon race	K 371
potato race	K 378
sack race	K 384
three legged race	K 390
tub race	K 390
water race	K 393
Racquets or Rackets (Game)	K 380
Radiators	
steam as distributors of heat	E 314
Radish	
icicle	G 95
indoor planting time	G 233
insect pests	G 291
planting seed	
depth to plant	G 42, 236
distance to plant	G 42
quantity to plant	G 36
time to plant	G 234
quick development	G 313
seed	
age for planting	G 34
germination per cent.	G 233
germination period	G 32
Raffia work	N 250-277*
basket making	N 243, 250-252
covers	N 252
handles	N 255-256
melon-shaped basket	N 257-259*
belts	N 273-274
braiding raffia	N 262-263*, 268
doll's hammock	N 271
doll's hat	N 253-255*

	PAGE
Raffia work—Continued	
fringe.	N 274
hats	
braiding	N 263-264*
trimming	N 264, 268, 270
weaving on wire frames	N 264-268
jewel case	N 260-261*
knotting raffia	N 271-275*
materials for	N 250
napkin ring	N 252, 253*
preparing the raffia	N 262, 268
shopping bag, knotted raffia	N 272-273*
skip stitch	N 257
Solomon's knot	N 265
split stitch	N 257
three strand braid	N 268-270
whisk broom	N 275*
winding stitch	N 257
Rafters. <i>See</i> Roofs	
Ragout	H 269
Ragweed	
class and seed time	G 278
Rain	
causes of.	B 355-356
drops, formation	B 357-360
shape	B 360
fall	
effect on forestation	B 361
measuring	B 349-353*
recording	B 362-363
gauge, making	B 350-353*
importance of	B 354
period of rainfall	B 360
table for measures	B 353
weather symbol.	B 362
Raisins	
food value	H 255
Raking	G 265
Ranges	
draughts and dampers	H 227-230
<i>See also</i> Gas range	
Raspberries	
food value	H 255
picking wild raspberries	A 9
Ratchet wheel	
mechanism	B 322-324*
Rats	
book about	A 519
electrocution device	E 271-273*
trapping	A 496

	PAGE
Rattan work	
baskets	N 243-248*
mats	N 247,* 249
whisk broom holder	N 249
Reamur thermometer scale	B 262
Receipts	
barberry jelly	A 17
canning elderberries	A 16
elderberry steamed pudding	A 16
green grape jelly	A 15
pickled walnuts.	A 37
thimbleberry jam	A 11
wild crabapple butter	A 22
<i>See also</i> Camping — Cooking; Cookery; Insecticides; Paste	
Red line, or Red lion (Game)	K 381
Red spider	G 293
Reed basket	
weaving	G 61-64*
Reel	
making a garden reel	G 51*
Refrigerator	
cleaning	H 109, 241
drainage, regulating	H 240
economy in ice supply	H 242
how to avoid odors	H 241
location	H 240
purifying.	H 242
Remington typewriter	B 403-409*
Renaissance lace. <i>See</i> Lace	
Rent	
what proportion of income to use for	H 74, 77, 78
Repairing. <i>See</i> Furniture; Soldering	
Repousse	
definition of.	M 210
Retaining walls	
batter, making	B 244-245
"closers"	B 244
designing	B 240-241*
foundation	B 238*, 245
Galveston sea wall.	B 247
"header"	B 244
pointing	B 246
"stretcher"	B 244
Rheostat. <i>See</i> Electric rheostat	
Rhubarb	
food value	H 255
Ribbon embroidery. <i>See</i> Embroidery	
Rice	
camp cooking	K 90
food value	H 254
washing	H 295

	PAGE
Rice— <i>Continued</i>	
wild rice	
characteristics	A 78-79
harvesting	A 79
uses of	A 78, 79
Richards, Ellen H.	
"Cost of living " quoted.	H 74
Rifles	
aiming	K 122
care and cleaning	K 123
learning to use	K 120-123
Rings	
iron, welding	M 248-250*, 254*
silver work	M 152-162*
steel, making	M 265*
<i>See also</i> Precious stones	
Rivers	
protecting river banks.	B 237
tides	B 227, 229
<i>See also</i> Retaining walls	
Riveting	
handles	M 88
iron tongs	M 288*
making rivets	M 77
metal.	M 73-77*
metal worker's tool	M 10*
rivet set	M 73
silver letters on copper	M 188-190*
stove pipe	M 74
Roads	
material for road-bed	G 85-86
repairing dirt roads	G 84-86
Roast pig, story	H 18
Roasting	
meats	H 282
open fire for	H 282
thickness of food	H 276
Robbers	
Irish stew and the robbers: story	H 15
Robin	
insect destroyers	A 457
migration	K 175
Rock	
how soil was formed from	G 213
<i>See also</i> Boulders	
Rock garden	
flowers to plant in.	G 325
location	G 324
plants	G 340
soil requirements	G 325

	PAGE
Roentgen rays	
ether waves	E 316
Roley bole (Game)	K 381
Roller	
ball-bearing principle	B 28
making wooden rollers	C 268*
moving rocks on rollers	B 18
Roman cut work	N 138-142*
Roof	
construction for summer house	C 418-422*
construction of frame	C 465-469*
cornices	C 421
hip roof, construction	C 466*
painting	B 42, C 422
rafters	
fitting	C 467*
making curved rafters	C 418
roofing paper	C 419
saddle boards	C 421
shingling	B 40-42, C 419-422*
estimating shingles	B 40
nails required	B 42
square of shingling or clap boarding, meaning	B 41
Rooms. <i>See</i> Bedroom; Dining-room; Furniture; Girl's room; Guests; House decoration; Kitchen; Living-room; Pantry; Servants	
Ropes	
carrying power of hemp	B 47
preservative for hemp	B 48
strength of wire rope	B 48
Roque	K 382
Rose	
Christmas, characteristics	G 333
insect pests and remedies	G 284, 293
Irish crochet	N 339-340, 344
moss, characteristics	G 332
Rose chafer	G 293
Rose jar	
copper work	M 56-60*
Rose slug	G 284
Rotascope. <i>See</i> Gyroscope	
Rotation of crops	G 149
Round steak	H 268
Round Table, Knights of	
how Gareth became a knight	H 20
Rowing	
intercollegiate record	K 383
Rubbed joints	C 251*
Rubber plant	
topping	G 199, 250
Rubbish	
disposal of	G 263

	PAGE
Rubicon (Game)	K 383
Rugby football	K 348
Rugs	
bathroom	H 156
beating-rack	A 444-446*
braiding	N 295-296*
carpets versus rugs	A 443-444
cleaning	A 443-448, H 128
dry cleaning	H 332
kitchen	H 193
Oriental, washing	A 447
storing	H 348
washing	A 446-447
weaving	D 252-260*, N 297-305*
color combinations	D 255
designs	D 252-253, 256-258*, N 302
materials	D 253, 258, N 301
preparing the woof	D 253-254
process	D 259-260, N 300-301
setting the loom	N 297-300
woof shuttle	D 254*
Rulers	
carpenter's rule	C 205
parallel, mechanism of	B 331*
Run, sheep, run (Game)	K 360
Running	
hare and hound chases	A 17
Russia calf for tooled leather	N 92
Rustic furniture	
collecting wood for	A 410
suggestions for making	D 209-211*
Rye	
food value	H 254
S	
Sable, Alaskan	A 484
Sachets	
herbs and grasses for	A 65
Sack racing	K 384
Sad iron. <i>See</i> Electric iron	
Saddles	
English, Mexican and army	K 225-226*
Safety valves for steam engines	B 116
Sage	
growing	G 327
Saint Francis of Assisi	H 25
Salad plant	
endive	G 305
lettuce	G 306
Salamander	
taming	A 266

	PAGE
Salary, <i>See</i> Income	
Salmon	
bait for	K 136*
food value	H 253
Salt	
removing stains with	H 358
Salt cellar	
silver work	M 183-184*
Salt pork	
cuts	H 270
Salvia	
bedding plants	G 324
San Jose scale	K 167
Sand bag	
definition of	M 210
Sand papering. <i>See</i> Whittling	
Sandy soil. <i>See</i> Soils	
Sanitation. <i>See</i> Garbage; Plumbing; Refrigerator; Sewerage	
Santos Dumont's monoplane	B 167*, 175-177
Sap. <i>See</i> Maple sugar	
Sardine	
food value	H 253
Sashes. <i>See</i> Doors; Windows	
Satin stitch	N 147-149*
combinations	N 148-154*
design	N 158*
Sauce	
wild crabapple	A 22
Sausage	
buckwheat cakes combination	H 258
food value: table	H 253
Sauteing	H 281
Saving	
methods	H 83-85
necessity and value	H 82
Savoury herb.	G 328
Saw horse	
making	C 143-149*
Saw mills	C 522
Saws	
band saw	C 522
brazing steel band saws	M 313
buck saw	C 172*
compass saw	C 172*
construction principles	C 171-172*
coping saw	C 20*
cross cut saws, principle and use	C 170*
danger of the power saw	D 187
gang saw	C 522
hack saw	C 175*
metal worker's tools	M 9*

	PAGE
Saws— <i>Continued</i>	
rating by points	C 173
rip saw, principle and use	C 169*
sawing copper work	M 35-36*
turning saw	C 173*
using, position for	C 174*
Saxifrage	
habits and characteristics.	G 340, 364
Scabiosa	
sowing and blossoming time	G 161
Scales	
mechanical principle	B 24-25*
Scalloping.	N 132-133*, 135
Scallops	
cooking	H 292
Scarf	
crocheted	N 318*
Scarf pin	
silver work	M 162-165*
Scarfig	M 254-257, 258
wrench	M 275*
Scarlet runner beans	G 297
Scarlet sage	G 324
Scarlet tanagers	
insect destroyer.	A 457
School grounds	
improving	G 72-87
Science	
value of study	E 338-340
Science club	E 339
Scilla, bell flowered	
planting and blooming time	G 177, 178
Scissors	
protecting points of	N 48
shears for metal work.	M 5*
Sconce	
copper work.	M 52-56*
Scorched stains	
removing	H 335
Scotland's burning	K 384
Scours	
remedy	A 120
Scouts. <i>See</i> Boy Scouts of America	
Scraper,	
definition of	M 210
Screen. <i>See</i> Fire screen	
Screw	
Archimedian	B 143-145*, 344*
case hardening screws	M 309-310
concealing in woodwork, method of	C 343*
countersunk, meaning	C 190

	PAGE
Screw— <i>Continued</i>	
driving	B 157
endless	B 142
finish	C 191
flat and round head	C 190-191*
friction, provision for	B 142
mechanical principle	B 139-147*
number designation	C 191
nut, principle of	B 140
power principle	B 140-147
principle applied to tools	B 156
removing, device for	B 157
rule for power	B 64
use of	C 190-192*
wooden screw, strength of	B 156
worm gear	B 141*
worm and wheel	B 145-147*
Screw drivers.	C 195, 199-203*
Screw propeller	
aeroplane	B 169-170, C 70-72*
blades	
area versus power	B 149-150
finding area	B 154
principle	B 147
features of	B 148
pitch, calculating	B 155*
power	
calculating	B 150-155*
principle of	B 149-150
speed, reckoning	B 148
Sea walls. <i>See</i> Retaining walls	
Seal	
electric	A 491
French	A 501
Hudson	A 491
Seams. <i>See</i> Dressmaking	
Search light, Electric	E 153*
Seasoning	
broiled meats and vegetables	H 276, 279
Seats. <i>See</i> Benches; Chairs; Settees	
Seaweed	
care of specimens before mounting	A 364
collector's outfit	A 363
mounting specimen	A 364-368*
time and places for collecting	A 363
varieties	A 369
Seeds	G 227-238
age for planting purposes	G 34
cotyledon	G 230
depth to plant; table	G 35, 235
distribution of wild seeds.	G 273

	PAGE
Seeds— <i>Continued</i>	
envelopes, making	G 56-58*
germination	
aiding	G 236
experiments	G 31
per cent.	G 232-233
table	G 32
method of improving	G 246-248
planting	
compacting soil	G 237-238
how to plant	G 99, 268
quantity to plant: table	G 36
time, indoor and outdoor	G 233-235
saving for sale or planting	G 371
selection	
germ developing power	G 231
impure seed	G 231
seed plants	G 227-228
size	G 228-233
selling, how to put up seed	G 371-372
soaking	G 138
testing for germinating value	G 33, 143
<i>See also</i> Grass seed; Trees; Vegetables; also names of plants, e. g., Beans; Nasturtiums; Pansy; Peppers, etc.	
Seesaw	
mechanical principle of	B 26
Selvage	N 15
September	
blooming plants	G 365
Servants	H 370-381
cook, duties	H 109, 112
days out, adjustment of work	H 111
duties	
four or five maids	H 105
one maid	H 104, 107
three maids	H 105, 108
two maids	H 104, 108, 112
hours	H 379
mistress and maid	
business relations	H 376-377
personal relations	H 371-375
personal liberty, lack of	H 372
proportion of income required for	H 76
room	H 378
servant question	H 370-381
meals, when served	H 105
waitress	
dress	H 173
duties	H 169-172
Serving table. <i>See</i> Buffet; Setting the table	
Serving the meal. <i>See</i> Meals—Serving	

PAGE

Serving tray	
copper work	M 75-77*
Seton, Ernest Thompson	
Boy Scouts organizer	K 49
Settee	
box furniture, making	C 477*
garden settle, making	D 200*
hall settle	D 49*
outdoor settee, making	C 410-411*
Setting the table	
dining table decorations	H 164
glasses	H 165
methods	H 167
serving table, use of	H 166
sideboard arrangements	H 166
silver	H 165
table linen	H 162-164
Settle. <i>See</i> Settee	
Sewer pipes. <i>See</i> Plumbing	
Sewerage system,	
importance of	H 214
Sewing	
apron making	N 26-30*
back stitching	N 12*
half back stitch	N 13*
bands for	
aprons	N 30*
skirts	N 39*, 44
basting stitches	N 7*
binding	N 51*
blanket making	N 54*
buttonhole stitch	N 58*
buttons	N 4-6
care of hands	N 19
counterpane for doll's bed	N 55*
crow's foot stitch	N 55*
darning	N 9-11*
felling seams	N 68
French hem	N 21
gathering	N 26-30*
stroking	N 27*
gussets	N 35-40*
helping mother	N 3
hemming	
French hem	N 21
gauge, notched card	N 17*
rolling the edge	N 21*
skirt	N 36, 43
straightening the edge	N 17
turning corners	N 20*
turning the hem	N 17

	PAGE
Sewing— <i>Continued</i>	
hooks and eyes	N 24-25*
knotting the thread	N 5
substitute for	N 14, 16
mattresses	N 53*
needle case	N 46-47
needles, emery for	N 19
over-casting	N 15*
over-handing	N 15-17*
patching	N 33-35
pillow cases	N 53*
plackets	N 35-40*, 43
plain sewing	N 3-11
position of sewer	N 19-20
rolling the edge	N 21*
running and back stitch combination	N 14*
running stitches	N 7*
scissors, how to hold	N 12*
seams	
felling	N 68
stitches for	N 12-17*
sewing apron	N 31-33*
sewing case	N 45-49*
stitches	N 12-25*
tape loops on towels and dresses	N 23*
thimble, how to use	N 4*
thread, length of	N 5
tucking	N 36
turning corners	N 20
whip stitch	N 21*
work box, fittings	N 3
<i>See also</i> Basket making; Bead work; Braiding; Dressmaking; Em-	
broidery	
Sewing machines	
boat-shaped shuttle type	
carriers and drivers, adjustment	B 303-304*
looping the thread	B 302
setting needles	B 305*
cleaning	B 281
oiling	B 281*
puckering, to prevent	B 283-285
rotary hook type	
bobbin case	B 293-295*
holder, adjusting	B 301*
compared with boat-shaped shuttles	B 299-300
construction	B 285-293*
feed, regulating	B 298
feed motion	B 337*
hook guide and hook driver	B 289-292*
hook ring	B 293
needle bars, setting	B 287-288

PAGE

Sewing machines—*Continued*

needles	
changing	B 292
setting	B 303-305*
presser foot	B 297-299*
repairing shuttles	B 300
stitch regulator	B 286*, 293
take up spring, replacing	B 295-297*
tension	B 288-289
thread controllers	B 301-303*
threading	B 286*, 298, 302
Wheeler and Wilson	B 299-300
shuttle action of different types.	B 283-284*
tension, adjusting	B 283-285
threads to use	B 282
types	B 280
vibrating shuttle	B 281-285*
presser foot, adjustment.	B 285
Wheeler and Wilson	B 299-300, 337
Shackles	
forging	M 349-352*
Shad	
food value	H 253
Shades	
cleaning window shades	H 131
<i>See also</i> Candle shade; Lamp shade	
Shadow embroidery	
stitches and materials	N 126-127*
Shagbarks.	A 39
Shamrock pattern for Irish crochet	N 341
Sharks	
catching	K 126
Sharpening tools. <i>See</i> Tools	
Shawl	
crocheting rainbow shawl.	N 316-317*
knitting	N 356-359*
Shears	
protecting points of scissors	N 48
tools for metal work	M 5*
Sheep	
feeding	A 104-105
book about	A 517
lambs, care of	A 105
raising	A 103-107
shearing	A 106
Sheepskin for leather work	N 83
Sheets	
making for doll-bed	N 54*
marking	N 157
<i>See also</i> Beds; Ironing	

	PAGE
Shell fish	
broiling oysters	H 275
food value	H 253
preparing for cooking	H 289-293
Shellac	
method of using	C 486, D 216-217
source and qualities	C 486
Shells	
book about	A 518
collecting	A 369-374
outfit	A 372
preserving and labeling specimens	A 374
Shelters. <i>See</i> Summer house	
Shelving. <i>See</i> Book case	
Shetland pony	
breeding for profit	A 205
characteristics	A 203-205
Shingling. <i>See</i> Roof	
Shinney	K 367
Shirley poppies	G 322
Shoe buttons	
how to sew on	N 6
Shoepac	K 209
Shoes	
base ball	K 264
foot ball	K 280*
for winter sports	K 208-209
Shooting	
hints on how to shoot	K 115-118
rifle shooting	K 120-123
"wiping his eye"	K 117
Shooting board	
how to make	C 189*
how to use	C 106*
Shop. <i>See</i> Carpentry and Woodwork; Work shop	
Shot guns	
aiming	K 113, 117
barrel lengths	K 120
care and cleaning	K 123
choke-bore gun	K 119
double barrels	K 111*
"drop" of a gun	K 113
for small game	K 112
learning to shoot	K 114-118
pattern, testing	K 118-119
selecting	K 112-113
styles for various purposes	K 119
unloading	K 115
<i>See also</i> Rifles	
Shovel	
blacksmith's shovel	M 226, 229*

PAGE

Shovel—*Continued*

- fire tools, making M 372-373*
 home-made snow shovel A 432

Shrubs

- characteristics, table G 355-356
 hazel bush A 34
 planting and transplanting G 134
 selection principles G 37, 354, 355, 357

Sideboard

- arranging for service H 166
 design D 55*

Siding. *See* House framing

Sieve

- making a garden sieve G 59-61

Signals and signaling

- marine flag code B 107-109
 weather signals B 361-362

Silkworm culture

- apparatus for rearing A 339*
 book about A 518
 cocoons
 preparing for market. A 347
 spinning A 345-347*
 weight of A 347

eggs

- hatching A 340-341
 laying A 338-339

- first age A 343

- food and feeding A 337, 339-346

- racks for A 342*

moth

- how it comes out of the cocoon A 347
 life of A 338

- molting periods A 343-345

- stages of growth A 337

- varieties of silk spinners A 338

Silver

- cleaning and care II 111, 185

- setting the table H 165

- washing H 183

See also Silver work

Silver fox

- book about A 517

Silver maple. *See* Maple

Silver work

- bar pins M 171-174*

- bezel setting M 152-157*, 163*, 176

- bracelets M 174-177*

- Indian design M 176-177*

- brooches M 171-174*

- characteristics of silver for working M 151

	PAGE
Silver work— <i>Continued</i>	
collar slide	M 170-171*
comb	M 194-196*
cuff links	M 192-194*
enameling on	D 355
gems	
selecting	M 152
setting	M 152-161*, 163*, 165, 176
hinges. <i>See</i> Metal work — hinges	
lettering silver on copper.	M 187-190*
links, making	M 167-169*
mustard spoon	M 182*
napkin ring	M 191-192*
necklaces.	M 166-170*
oxidizing silver	M 204
pendants.	M 169
picture frame	M 181, 185-186*
pin	M 163-164*
rings	
bezel setting	M 152-157*
deep set stone.	M 157-159*
prong setting	M 159-161*
twisted silver wire	M 161-162*
riveting letters	M 188-190*
salt cellar	M 183-184*
salt spoon	M 183*
scarf pin.	M 162-165*
setting the stone	M 165
spoons	M 178-184*
sugar tongs	
bowl design	M 182*
claw design	M 180-182*
tools	
chisel, making	M 157*
mandrel	M 154*
watch fob	M 187-190*
<i>See also</i> Copper work; Metal work	
Simmering	
definition	H 277
Sink	
location and care of kitchen sinks	H 193
Sirloin steak	H 269
Skate sailing	K 215-216*
Skating	K 210-216
club skate model	K 210*
damming a brook or pond	A 280
fancy figures	K 210
hockey skates and playing	K 212-215*
racing skates and skating	K 211
sprinting stroke	K 212
tennis court for skating pond	A 279-280

PAGE

Skee. <i>See</i> Skiing	
Skiing	K 219-222*, 385
jumping	K 222
ski pole	K 222*
skis	K 218-220*
Skins and hides	
curing	A 511
removing	A 510
tanning	A 511-512
solution	A 507
Skirts. <i>See</i> Dressmaking	
Skittles	
lawn skittles	K 368-370
Skunk	
nests and habits	A 485
pelts, value	A 484, 487
tame	A 270
trapping	A 484-486
Sled	
bobsled	K 223*
toy, working drawing	C 40, 42*
Sledge	
blacksmith's tool	M 226
Sleep and sleeping	
advantages of outdoor sleeping	A 6-9
preparation for outdoor sleeping	A 9, 52*
Sleeves. <i>See</i> Dressmaking	
Slippers	
crocheting	N 324-329*
Slippery elm	C 559
Slugs	
exterminating	G 118
garden pests	G 285
rose slugs	G 284, 293
Small fruits. <i>See</i> Berries	
Smartweed	
class and seed time	G 278
Smilax, Southern	A 55
Smith Premier typewriter	B 409-411*
Smocking	
honeycomb pattern	N 112-114
stitch	N 114*
Smoking	
dangers of	K 13-14
Smoking set	
copper work	M 79-86*
Snake	
taming	A 266
venomous	K 149
Snake's head	G 349, 365
Snapdragon	G 277

	PAGE
Snares. <i>See</i> Traps	
Snarling iron	
definition of.	M 210
Snow	
crystals, forms and colors	B 366-368*
formation	B 366
line	B 368, 369
measuring snowfall.	B 367
perpetual snow	B 368
shoveling.	A 431-432
uses of	B 367
weight	B 367
Snow shoeing	
skis and skiing	K 217-222*
snow shoes	K 216-217*
Snowballs	
Japanese	G 37
Snowdrop	
planting and blooming time	G 177
Soap for laundry	H 319
Soccer. <i>See</i> Foot ball	
Socket wrench. <i>See</i> Wrench	
Sockets	
making an open wire rope socket	M 281-283*
Soda	
combined with cream of tartar	H 301
some uses of	H 356
sour milk and	H 357
Sofa cushion. <i>See</i> Pillow	
Softening metal. <i>See</i> Annealing	
Soils	
acid, improving.	G 30, 115, 222
adapting crops	G 17-23
clay	
absorption of water	G 218
characteristics	G 8
formation	G 214-215
improving	G 9, 104, 218-219, 224
lime for acid soil	G 30
elements	G 8
formation of.	G 213
humus	G 8
improving poor soil	G 9, 103-105, 218-219, 224
impure air in	H 208
inoculation, purpose and method	G 119, 122
lime	
absorption of water	G 218
formation	G 215-216
humus for	G 225
improving	G 218
testing for	G 216

Soils—*Continued*

PAGE

- loam, meaning of G 220
- preparing for grass seed G 74-76
- physical and chemical needs G 9
- sand
 - absorption of water and heat G 217
 - characteristics G 8
 - formation of G 214
 - improving G 9, 218
 - nitrogen needed G 224
- subsoil G 220
- testing G 28-31
- top-soil G 220
- See also* Drainage; Flower gardening; Plant food; also names of plants
- Soldering
 - brass vase M 144
 - copper handles M 78-79
 - electric iron for E 116*
 - hard soldering, materials and directions M 41-42
 - heat and tools for M 11-12*
 - iron, making M 45-46*
 - metals M 41-46*
 - outfit B 252, M 11-12*
 - preparations B 252
 - process B 253
 - soft soldering
 - materials and tools M 43
 - process M 40, 43-45
 - tinker's dam B 253
 - unsoldering M 205
- Solomon's seal, false
 - habits and characteristics G 345
- Song birds. *See* Birds
- Sorrel
 - class and seed time G 278
- Sound
 - production of E 281
 - variation with speed E 292
 - velocity B 249-251, E 311
 - in dry air, water and metals B 250
 - independent of pitch E 316
 - vibrations of metal disks E 294-295
 - waves E 310
 - length B 251, E 315
- Soups
 - beef stock, what to buy H 268
 - boiling meat for stock H 278
 - to keep from curdling H 356
- Soutache braid
 - for braiding N 107

	PAGE
Spading	
how to spade	G 88, 265
Spanish fly (Game)	K 385
Sparrow	
bird enemy	K 174
book about	A 519
migration of song sparrow	K 175
Specific gravity	
meaning and application	B 279-280
Speed indicator	
mechanism and use	E 231*
Spice bush	
characteristics	G 355
Spiders	
food for young wasps	A 391
nature study	K 145
Spiked loosestrife	
characteristics	G 365
Spinach	
cleaning	H 294
food value	H 255
germination per cent. of seed	G 233
time to plant	G 234
Spindle	
copper work	M 124-126*
Spinning. <i>See</i> Silkworm	
Spirea	
characteristics	G 356
hedge shrub	G 357
Van Houtte's, a good variety	G 37, 38
Spirit level	C 205*
Splice or scarf joints	C 257*
Spoons	
mustard spoon, silver work	M 182*
nut set spoon, copper work	M 39-40*
salt spoon, silver work	M 183
tea spoon, silver work	M 178-180*
Sports	
girls' outdoor sports	K 318-325
winter sports	K 208-224*
<i>See also</i> Archery; Base ball; Camping; Canoeing; Coasting;	
Cricket; Curling; Fishing; Foot ball; Games; Golf; Horse-	
manship; Hunting; Racing; Rowing; Shooting; Skate sailing;	
Skating; Skiing; Swimming; Track athletics; Trapping; Walk-	
ing	
Spots. <i>See</i> Cleaning	
Spring beauty	
habits and characteristics	G 340
transplanting	G 340
Springs (Machinery)	
air spring	B 331*

PAGE

Springs (Machinery)—*Continued*

bearing springs	B 265-266
car springs	B 265*
cross bow, making	B 266*
draw spring	B 265*
tempering steel	M 295
uses	B 264

Springs (Water)

preparing for trout culture	A 273-274
reclaiming springs	A 274-277
story of how one spring was reclaimed	A 280-282

Sprocket wheel	B 327*
--------------------------	--------

Spruce gum

gathering	A 80-83
making	A 82
marketing	A 82
uses	A 81
white spruce	A 81

Spruce tree

seed year	A 47
variety and characteristics	C 537-538

Squabs

book about	A 517
care of	A 216
homers as breeders	A 194-195
killing and dressing	A 196
marketing and profit	A 195
raising	A 193-197
record keeping	A 216
where to get information about	A 194
<i>See also Pigeons</i>	

Square, steel

carpenter's tool.	C 205*
metal worker's tool	M 5*

Squash

food value	H 255
insect pests	G 287, 291, 292
planting seed	G 312
depth to plant	G 236
time to plant	G 234
seed	
age for planting	G 34
germination per cent.	G 233

Squash (Game)	K 386
-------------------------	-------

Squirrels

as pets	K 184
bad habits of the red squirrel	A 267
bait for	A 508
flying squirrels as pets	K 185
taming	A 266-267

	PAGE
Stabblcr, Sydney S.	
My experience with honey bees.	A 328-331
Stains and staining	
alcohol stains, value of	D 227
applying stains	D 228-229
asphaltum	D 229
black walnut imitation	D 230
brown stain	C 223
chemical	
composition and use	C 483
preparing	C 488
Flemish oak.	D 231
forest green oak	D 232
fumed oak and chestnut, process	D 233-234
golden oak finish	D 229
gray oak.	D 232
mahogany imitation	D 230, 231, C 489
mission oak	D 231
natural colors versus imitation	C 482
object of staining	D 226
oil stain	
composition and use	C 483
merits of	C 487, D 227
perfect stain	D 227
preparation of surface.	C 483
water stain	
advantages of	C 487, D 227
composition and use	C 483
weathered oak	D 233
Stake pin	
making	M 233-235*
Stand pipe	
principle of	H 215
Staples	
designing and making	M 235-236*
Star of Bethlehem	
planting and blooming time	G 177
Starch	
boiled starch, making	H 320
cold starch, making	H 319
protecting	H 319
starching clothes	H 323
sticking to irons, to prevent	H 335
Stars	
effect of aerial tides	E 229
telling points of the compass by	K 109
time required for light to travel from	E 312
Starting box (Electric)	E 48
operation of	E 81-83*
Steam	
condensation	B 125

PAGE

Steam—*Continued*

dry steam	B 125
expansion principle	B 127
generation of	B 115-116
heat units	B 126-127
wet steam	B 126
Steam engines	
Calipyle	B 114-115
cylinder and piston	B 117-118*
disk engine	B 334*
governors	B 313-316*, 329
gyroscope	B 335
heating principle	B 121
hero engine	B 114*
history of	B 114-115, 272
horsepower, estimating	B 122-124
noise from exhaust, reason	B 113, 120
power generation and distribution	B 117-120
principle of	B 115-117
rotary	B 340*
safety valve	B 116
slide valve	B 118-120*
toe and lifter for valves	B 329*
waste in power	E 6
Steam radiators as distributors of heat	E 314
Steam turbine	B 128
Steam whistles	
why steam is seen before whistles are heard	B 249
Steamboats	
development of	B 271
<i>See also</i> Screw propeller; Steam turbine	
Steel	
annealing	M 307-309
Bessemer steel	
manufacture and use of	M 267
brazing	M 313
carbon steel	M 289, 308
case hardening	M 308-310
crucible cast steel, making	M 297
cutting tool steel	M 299
grades	M 296
hardening	
forged fires for	M 290
lathe tools	M 301
solutions	M 291-292
hook, making	M 266-271*
invention of	B 271
lanterns, making	M 405-406*
manufacturing	M 267
oxidation, prevention of	M 291
sockets, forging	M 281-283*

	PAGE
Steel— <i>Continued</i>	
soft	M 264-288*
weldless ring, making	M 265*
working heat	M 264
stretching processes	M 315
tempering	M 292-296
color scheme	M 293-295
grade of steel required	M 296
lathe tools	M 301
side tool	M 304
testing	
for carbon	M 289
for hardness	M 292
tool making	M 322-326
tool steel	M 289
welding	M 296
wrenches, forging	M 273-283*
wrought iron versus.	M 266
<i>See also</i> Knives; Tool making	
Stenciling	N 73-82*
brushes for	N 79-80*
color schemes	D 114
corner designs for borders	D 111-112
cutting the stencil	D 113, N 76
designs, making	D 108-113*
repeating unit	D 110*
transferring	D 113
materials and tools	N 81, D 108
outline drawing.	D 112
paints for	
mixing colors	N 81-82
testing	D 114-115
patterns, making from paper	N 76-79*
pillows	N 77*, 378
pinning the stencil.	D 114
process	D 115-116, N 79
repeating and joining units	D 110*
reversing the pattern	N 80
stencil bands, size and purpose	D 109-110*
use in home decoration	N 76, 377
washable.	N 80
water colors for	N 81
Stereopticon lamp	E 154*
Stewing	H 280
Stickseed	
class and seed times	G 278
Still pon no moving	K 337
Stings	
care of	H 364
Stitches. <i>See</i> Crocheting; Embroidery; Knitting; Lace making;	
Sewing	

	PAGE
Stock	
sowing and blossoming time	G 161
ten-weeks, characteristics	G 330
Stock breeding, <i>See</i> Breeding	
Stockings	
darning	N 9-11*
Stone wall for lawn	G 73
Stones. <i>See</i> Boulders; Precious stones	
Stools. <i>See</i> Foot stools	
Storage battery. <i>See</i> Electric batteries	
Store room in cellar	H 211
Stories	
Brother Juniper's cooking	H 25
Fire of coals	H 37
Irish stew	H 14
King Alfred and the cakes	H 16
King's kitchen	H 20
Loaves and fishes	H 32
The luncheon	H 32
Roast pig	H 18
Widow's cruse of oil	H 29
Storing. <i>See</i> Packing	
Stove pipe	
riveting	M 74
Stoves	
draughts and dampers	H 227-230
laundry	H 315
<i>See also</i> Fire making; Gas range; Ovens	
Strawberries	
care of first-year plants	G 92
experimenting with varieties	G 92-93
food value	H 255
growing	G 88-96
hill culture versus matted row	G 94
planting rules	G 93-94
soil and location	G 88
staking the bed	G 91*
wood ashes for fertilizer	G 94
Street cars. <i>See</i> Electric cars	
Strength of materials	
nails	B 46-47
ropes, hemp and wire	B 47-48
timbers, estimating	B 45
woods	C 495-497*
String beans	
cooking preparations	H 295
food value	H 255
planting	G 297
Striped beetle	
remedy for	G 285
Stump master (Game)	K 387

	PAGE
Submarine cables. <i>See</i> Cables, Submarine	
Suckers (Game)	K 337
Sugar	
food value	H 254
Sugar bush. <i>See</i> Maple sugar	
Sugar-scoop	
making a wooden scoop	C 272*
Sugar-tongs	
silver work	M 180-183*
Sumach	
Christmas green	A 56
Summer cottage. <i>See</i> Cottages	
Summer house	
building	C 441-424*
location	G 363
making a double seat for.	C 421-424
Sun	
cooking processes	H 274
distance from earth	B 290
time required for light to travel from	E 312
<i>See also</i> Tides	
Sundial	
making	B 209-210*, G 64-66*
setting up	G 160-162
sun time versus clock time	G 161
Sunflower	
double, characteristics	G 334
food for squirrels	G 20
late, characteristics	G 334, 365
planting seed	G 106
sowing and blossoming time	G 161
Swages	
blacksmith tools	M 225*
Swallows	
migration	K 176
Swans	
varieties	K 181
Swastika	
inlaying design on wood	C 322, 323*
Swedish drawn work. <i>See</i> Hardanger embroidery	
Sweeping carpets and rugs	H 129
Sweet alyssum	
characteristics	G 329, 330
planting seeds	G 157, 322
Sweet clover and sweet fern leaves for sachet.	A 65
Sweet flag	
characteristics	G 306
Sweet grass	
basket making	A 64
Sweet lavender	G 327

PAGE

Sweet pea	
characteristics	G 329, 330
Sweet potato	
food value	H 255
Sweet sultan .	
characteristics	G 330
Sweet William	
biennial	G 322
characteristics	G 335, 365
Swimming	
accidents.	K 239
artificial supports	K 239
breast stroke	K 235
dangers, avoiding	K 234
diving	K 238*
dog stroke	K 234
fancy stroke	K 238
girls as swimmers	K 320
learning how	K 234-237
on the back.	K 238
overhand or overarm strokes	K 237
pool, artificial	
cost	A 285
in back yard	A 282-286
keeping water fresh	A 286
pool, book about	A 518
pool, natural	
damming of stream	A 278-279
strokes	K 234-235, 237-238
value as exercise	K 234
Swine	A 126-132
book about	A 517
brood sow	
care of	A 130-131
selecting	A 129
cleanliness	A 129
fattening.	A 131
feeding young pigs.	A 131
pen, building	A 127
profit in raising	A 129
Sycamore	
characteristics	C 562
Sycamore maple. <i>See</i> Maple	
Symbols. <i>See</i> Signals	
Syrup. <i>See</i> Molasses; Maple sugar and syrup	

T

Table linen	
care of	H 163
ironing	H 327
marking	N 157

	PAGE
Table runner	
block printing	D 102-106
designs	D 99-101
materials	D 98
weaving	D 273-276
Tables	
checkerboard table, making	C 337*
dining table design	D 54*
drawing table, making	C 391-394
fastening table tops to prevent warping	D 135*
kitchen	H 194
library table	
design	D 51*
heavy, design and construction	D 174-176*
light, design and construction	D 170-174*
mission style, making	C 360-367*
wood finish	D 237
picnic tables, making	B 132-134
polished, care of	H 161
round centre table	
design and construction	D 180-184*
wood finish	D 237
tea table, mission style, making	C 367-372*
<i>See also</i> Setting the table	
Tabourette	C 301-312*, G 53-55
circular top, making	C 302-304*
estimating lumber for	C 506
hexagonal top	C 305-308*
mission style, making	C 308-310*
Moorish design	C 310-312*
octagonal top, making	C 304*
working drawings	C 303, 307*
Tag (Game)	K 345
last tag	K 370
warning	K 391
wood tag	K 394
Tamarack <i>See</i> Larch	
Tanager	
migration	K 176
Tanning skins	A 507, 510-512
Tantalum lamp	
metal filament	E 145
Tapes	
sewing on	N 23*
Tapestry	
weaving	N 303-304
Tapioca	
food value	H 254
Tarnish on brass	
preventing	M 140

PAGE

Tarpon	
catching	K 126
Tea	
camp cooking	K 87
Tea caddy	
brass work	M 136-140*
Tea kettle	
iron work stand for, making.	M 406-409*
Tea pot stand	
copper	D 351-353*
Tea pots	
care of	H 207
Tea spoons. <i>See</i> Spoons	
Tea stains	H 359
Teeter-tauter	
principle of	B 26
Telegraph	
invention and development	E 59-61
key	E 63*
Morse code reading	E 63
poles, use of glass knobs	E 64
relay	E 67-68*
signals, how produced	E 61-63*
sounders, operation of.	E 63
wires, insulation	E 64
<i>See also</i> Cables; Submarine; Wireless telegraph	
Telephone.	E 274-295
automatic registering device	E 276
bells	
magnets for ringing	E 287-290
operation of	E 289
burning out of the coil	E 291
central battery system	E 276
current in telephone circuit	E 287
double metallic circuit, first used	E 275
electric spark coil	E 279-281
history of	E 274-276
lightning arrester	E 292*
music transmitted by	E 295
pole, equipment	E 290
receiver	
as switch and circuit.	E 290
construction and action	E 276-278*
operating by induced current	E 351-352
principle of	E 93-95*
vibrator	E 278-282
resistance in the circuit	E 285-287
simple telephone system	E 283-285*
sounds, how produced.	E 22, 277-282
transmitter, construction	E 282-284
vibrations of disks	E 295

	PAGE
Telephone — <i>Continued</i>	
volume of business in 1907	E 274
wires	
installation	E 290
use of ground wire	E 292
Telescope	
water telescope	K 159
Telharmonium	E 293-295
Temperature. <i>See</i> Thermometers	
Tempering	
hand hammers	M 317, 321
knives	M 356
lathe tools	M 301, 304
steel	M 292-296
Teneriffe lace	N 238*
Tennis.	K 284-296*
court tennis	K 341
girl's sports	K 322
hand tennis	K 356
"love"	K 294
playing the game	K 293-296
racket	
how to hold	K 295*
selecting	K 285
scoring	K 294
stroke	K 295
tether tennis	K 388
Tennis court	
accessories, making	C 406-422*
back stop, making	C 403-405*
dimensions and directions	C 399, K 286-287*
drainage	K 288
grass versus clay	K 285, 287
laying out	C 399-402*
making and caring for	A 428-431
marker, home made	A 430
marking	K 290-293*
net, putting up.	C 403
post for net, placing and preserving	C 402
surfacing and leveling	K 289
Tents	
"A" tent	K 60*
brush lean-to	K 69*
Indian tepee	K 63*
lean-to	K 59, 69*
trapper's tent	K 62*
wall tent	K 58*
Tetanus	
cause of	B 248
Tether ball	K 388
Tether tennis	K 388

	PAGE
Thermometers	
centigrade scale	B 262
changing one scale into another	B 262-263
Fahrenheit scale	B 262
history and purpose	B 261
scales in use	B 261-263
theory of	B 261
Thermostat, Electric	E 124
Thimble	
how to use	N 4*
Thimbleberry	
description of	A 10
jam, receipt	A 11
picking	A 11
Thistle	
Canada, class and seed time	G 278
Russian, class and seed time	G 278
Thorn apple	A 23
Thrasher, brown	
insect destroyer	A 456
migration	K 175
Thrush	
migration	K 176
Thunder	
weather symbol for thunder storm	B 362
why thunder is heard last	B 249
Tides	B 212-236
aerial	B 228
cause of	B 217-220
ebb and flow	B 218
elevations, changes in	B 226-227
height	B 229
lakes	B 228
lunar	B 217-227
moon's distance from the meridian, effect of	B 225-227
neap tides	B 223
open seas	B 227
rivers and channels	B 227
Sir Isaac Newton's theory	B 217-218
solar	B 222-223, 225
spring tides	B 223-225
theory of	B 220-226*
time, changes in	B 218-220
Tidiness	
meaning of	H 51
Ties	
Irish crochet	N 338-344*
Tile drains. <i>See</i> Drainage	
Tiles	
cleaning	H 136
decoration of	D 317

	PAGE
Tiles— <i>Continued</i>	
fireplace tiles	D 318-320
for kitchen floors	H 191
making	D 315-320*
tea tiles	D 318*
uses	D 315
<i>See also</i> Drainage	
Timber. <i>See</i> Building; Lumber; Strength of materials; Trees; Wood	
Time	
day and night, cause of	B 213
division of	B 214
Tin	
kitchen utensils.	H 202
<i>See also</i> Soldering	
Tinker's dam.	B 253
Tip cat	
drawing and making	C 35-37
Titmouse	
insect destroyer.	A 456
Toad	
book about	A 517
enemy to cut worm	K 168
garden pest destroyer	G 280, A 265
taming	A 266
Toasters, Electric	E 115
Tobacco jar	
copper work.	M 82-85*
Tobogganing	K 223
Toilet boxes. <i>See</i> Box making	
Toilet closets. <i>See</i> Closets, toilet	
Toilet fixtures	
care of	H 148, 155, 156
Tomato	
dwarf champion	G 314
food value	H 255
indoor planting time	G 233
insect pests	G 286, 292
peeling tomatoes	H 294
planting seed	
depth and distance to plant	G 42
quantity to plant.	G 36
time to plant	G 234
removing ink stains with	H 359
seed	
age for planting	G 34
germination per cent.	G 233
germination period	G 32
staking the vines	G 119
starting and transplanting	G 118-119
vines, overgrowth of	G 313

	PAGE
Tommy Tiddler's Land (Game)	K 345
Tongs	
blacksmith's tools	M 226*, 228
fire tools, making	M 374-377*
iron tongs, making	M 285-288*
Tongue and groove joints	C 257*
Tongue grafting. <i>See</i> Grafting	
Tool boxes and chests	C 226-227*, 339-341*
old-fashioned chest.	C 341-344*
suit case design	C 345-346*
Tool making	M 296-306*
boring tool	M 304*
cape chisel	M 299*
centre punch	M 297*
cold chisel	M 298*, 325
crowbars	M 352*
cutting off tool	M 305*
diamond point	M 301*
dividers	M 340-341*
drills	M 347-349*
eccentric strap	M 334*
fire screen	M 11*
fire tools.	M 370-379*
hammers.	M 7*, 316-324*
hardening	M 289-292
hardie	M 322*
hoe	M 328-330*
hot chisel	M 324*
lathe tools	M 300-306
nail puller or claw tool	M 353*
pitch fork	M 239*
rock drills	M 334-349*
round nose	M 300
set hammer	M 323*
shovel	M 372-374*
side point	M 303
steel for	M 289
stone chisel	M 341-344*
stone pick	M 344*
tempering steel for	M 292-296
tongs, iron	M 286-288*
wood chisel	M 337-338
wrenches, steel	M 273-281*
<i>See also</i> Forging; Steel; Welding	
Tooled leather. <i>See</i> Leather work	
Tools	
anvil stake	M 10*
beck iron	M 208
burners	M 11-12*
calipers	M 255
chisels	M 9, 157*, 225*

	PAGE
Tools— <i>Continued</i>	
dividers	M 5*
using	M 24*
draw plate	M 100*, 102, 209
drills	M 9*
enameling tools	M 197
face plate	M 209
files	M 9*
fullers	M 224*
gouges	M 225
graver	M 209
hack saw	C 175
hammer	M 7*
hand hammer	M 224*
peen	M 254*
set hammer	M 225*
hardie	M 226*, 274*
jewelers' snips	M 5*
leather work tools	D 323-324*, N 91*, 96*
mallet, wooden	M 8*
mandrel	M 209
matt tool	M 210
pin	M 210
pitch block	M 210
planishing hammer, using	M 22*
pliers	M 6*
pottery modeling tools	D 285-287
principle of the inclined plane applied to	B 59
punch	M 7*, 297*
ring mandrel	M 154*
riveting tool	M 10*
sand bag	M 210
saw frame	M 9*
scraper	M 210
screw principle	B 156
shaping tools	M 10*
shears	M 5*
shovel	M 226*, 229
sledge	M 225
snarling iron	M 210
soldering outfit	M 11-12*
square, steel	M 5*, C 205*
stake and riveting tool	M 11
swages	M 225*
tracer	M 211
tongs	M 226*, 228
vise	M 6*, 21*, 22*
wedge, principle of	B 59-61*
wooden block	M 6*, 19*
using	M 28*

PAGE

Tools—*Continued*

See also Carpentry and Woodwork — Tools and appliances; Chisels;
Drilling and boring tools; Gardening — Tools; Hammers;
Tool boxes; Tool making; Wedge; Wrenches

- Topping plants G 199, 250-251
- Tops
 plug in the ring K 376
- Towel rack
 making a wooden rack C 274*
- Towel roller
 making a wooden roller C 267-269*
- Towels
 marking N 157
- Toy making C 40-49
- aeroplanes C 68-83*
- boat in a storm C 52-56*
- designing moving toys C 58-60*
- dog house C 42*
- electric engine E 58*
- electric spinner E 57*
- electric train operated by wireless outfit E 325-327*
- fencers C 46-48*
- happy Jack windmill C 159*
- Indian paddlers C 44-46*
- moving toys C 58-95
- cautions C 61
- method of procedure C 58-60*
- racing automobile C 62-66*
- sawyers C 50-52*
- turkey and executioner C 56-57*
- wooden boxes C 40*
- See also* Kites
- Toys
 giving away H 10
- inventions and discoveries H 11
- Tracer
 metal worker's tool M 211
- Track athletics
 all round championship K 328
- best college record K 336
- intercollegiate contest events. K 360
- Olympic games, events K 372
- one hundred yard dash, best record K 329
- scoring in all round championship K 328
- Trained animals. *See* Animals
- Transferring
 embroidery patterns N 128-129
- stencil designs D 113
- Transplanting. *See* Vegetable gardening; also names of plants, e. g.,
 Beets; Lettuce, etc.
- Trapping A 478-510

	PAGE
Trapping— <i>Continued</i>	
baiting traps	A 509
carrot bait	A 508*
for muskrats	A 505
books about	A 519
box traps	A 479*, C 454*
deadfall trap	A 486, 509, C 454*
gophers	A 455*
land animals	A 493
mink	A 483-484
moles	A 489-491
muskrats	A 491-493, 505
profit and recreation in	A 501
rabbits	A 497-501
rats	A 495-497
river trapping	A 504
rules of the game	A 479-483
skunks	A 484-488
snares	C 455*
with carrot bait	A 508*
steel jaw traps, setting	A 504
steel traps, cruelty of	A 502
stop-thief traps	A 505-506*
traps, humane and inhuman	A 502
swamp trapping	A 503
water animals	A 502
weasel	A 494-495
woodchucks	A 488
Traps (Plumbing)	
construction and purpose	H 217, 218
defective, reason and remedy	H 218
location	H 217, 219
Trash	
disposal of	H 220
Trays	
gouge work	C 258-265*
<i>See also</i> Copper work	
Tread-mill	
training dogs to run	A 255-256
mechanism	B 337*
Trees	
age, how to tell	C 525
broad leaved	C 532-533, 543-555
compound leaves	C 543*
doubly compound	C 543*
maple	C 544-548
oak	C 548-555
simple leaves	C 543*
cambium layer	A 441
classification and characteristics	C 532-566
coniferous trees, names and characteristics	C 535-542

Trees — *Continued*

PAGE

cutting down, art of	K 98-99*
danger of roots to cement walks	B 15
growth process	C 525
heart wood versus sap wood	C 526
identifying	A 48, 71
planting directions	G 80-82
playhouse in a tree	H 3
products of	C 511
qualities of different varieties	K 101
rings, meaning	C 525
selecting and planting	G 78-82
seeds for propagation	
gathering	A 46-50
ripening and drying	A 48
treatment, where to get information	A 49
table describing	G 367
<i>See also</i> Forestry; Fruit trees; Grafting; Landscape garden- ing; Lumber and lumbering; Nuts; Pruning; Wood; also names of trees, e. g., Maple; Oak; Pine, etc.	
Trellises	D 209-211*
Trench. <i>See</i> Cement walk; Drainage; Gardening	
Trestle. <i>See</i> Saw horse	
Triangles (Tools)	
making	C 386-388*
Trick joints	C 257*
Trilliums	
habits and characteristics.	G 344
Trimnings. <i>See</i> Crocheting	
Triplane	B 180
Trolling	K 139*
Trophy stick, notched	C 11*
Trout	
bait	K 134, 135
culture from eggs	A 273
feeding	A 272
reclaiming the trout stream	A 271-272
Trout lily.	G 342
Truck garden. <i>See</i> Vegetable gardening	
Trumpet vine	
decorative value	G 359
T-square	C 24*
making	C 384-386*
to prevent warping	C 394
Tub racing	K 390
Tubs. <i>See</i> Bathtubs; Laundry	
Tucking	N 36*
Tulip	
cone developer	G 175
planting bulbs indoors	G 166
red, planting and blooming time,	G 179

	PAGE
Tulip— <i>Continued</i>	
tree, characteristics	C 561
varieties	G 168
white, planting and blooming time	G 177
yellow, planting and blooming time	G 178
Tungsten lamp	
cost of	E 141*, 144
metal filaments	E 145
Turbines	
Founeyron	B 342*
Jonval	B 341*
steam	B 128
water.	B 145
Turkey	
book about	A 519
breeds	A 185
enemies, lice and wet	A 184
feeding young turkeys.	A 183, 184
food value	H 253
habits of turkey hen	A 183
hatching, time required	A 183
laying and sitting habits	A 183
raising	A 182-185
selection of, for cooking	H 271
Turn spit dog	B 337
Turnip	
food value	H 255
planting seed	
depth and distance to plant	G 42
quantity to plant.	G 36
time to plant	G 234
seed	
age for planting	G 34
germination per cent.	G 33, 233
germination period	G 32
soil	G 314
Turnip-root cabbage	
planting	G 300
Turpentine	
moth exterminator	H 347
paint stain remover	H 359
Turtle head	
characteristics	G 365
where found	G 349
Turtles	
taming	A 266
Typewriter	
alignment	B 420
"blind" writer	B 406
carbon copying device.	B 418
card indexing device	B 415

	PAGE
Typewriter—Continued	
carriage	B 403, 404
interchangeable,	B 415*, 416
mechanism of	B 421
disconnecting parts	B 413
double shift	B 406
duplicators	B 416-418
essential features	B 419-422
invention of.	B 402
keyboard	B 403, 406, 412, 419
universal	B 412
kinds	B 402
line-spacing mechanism	B 405, 421
noiseless operation	B 422
Oliver, mechanical principle	B 412-413*
paper feed	B 404
platen	
essentials	B 421
interchangeable	B 415
Remington	
description of parts and their uses	B 403-407*
improvements	B 407-409
ribbon movement	B 422
ribbons, two and three colors	B 409, 411, 414
scales.	B 406
semi-visible writers.	B 407
single shift	B 406
Smith-Premier	B 409-411*, 414
spacing bar	B 405
tabulator	B 413-414
type	
cleaning	B 421
cleaning device	B 410
mechanism	B 403, 404, 409, 412, 420
visible writers	B 407
work done by	B 402

U

U-tube, theory of	H 215-216
Umbrella handles	
woods and roots for	A 59-61
Umbrella stand	
design and construction	D 161-165*
iron work	M 409
mission design	C 375*
wood finish	D 236
Unleavened bread	
nutriment	H 300
Upsetting. <i>See</i> Forging	
Upstairs work	H 146-159
Utensils. <i>See</i> Kitchen utensils	

	PAGE
V	
Vacuum cleaner	
electric	E 243*
home made	B 378-386*
plunger pump, making	B 379-381*
power driven, home made	B 381-386*
principle of	E 53
using	B 386
water motor	B 381*
Valerian	
characteristics	G 333
Vane. <i>See</i> Weather vane	
Varnish and varnishing	
drying, time required	D 221-222
dull finish	D 224
flat finish	D 224
grades of varnish	C 486
method of using	B 112, C 486
number of coats needed	D 222
quality of varnish, recognizing	D 220
rubbing down process	D 223
"sag" and how corrected	D 220-221
Vase	
brass work	M 140-145*
concrete garden vase, making	D 203-209*
pottery, making	D 307-310*
typical flower holders	D 87-89*
Veal	
as chicken	H 358
cuts and their uses	H 269
food value; table	H 253
Vegetable gardening.	G 296-315
combinations for late planting	G 116
indoor and outdoor planting time	G 233-235
intermingling from close planting	G 105
money making garden.	G 368-374
planting tables	
age for planting	G 34
depth and distance	G 42
germination per cent.	G 233
germination time	G 32
quantity to plant.	G 36
seeds, selling	G 371-372
selling young plants	G 370-371
transplanting	G 268-270
from the coldframe	G 101-102
strawberry boxes for	G 118
<i>See also</i> Coldframe; Drainage; Fertilizers and manures; Gardening; Herbs; Hotbed; Insect pests; Plant food; Plants; Soils; also names of vegetables, e. g., Beans; Cabbage; Carrot, etc.	

	PAGE
Vegetables	
boiling	H 279
burning, treatment	H 356
camp cooking	K 89, 90
cleaning	H 293
cooking	H 356
preparation for	H 293-295
with left overs	H 355
dandelion greens	A 63
exhibits, preparation for	G 202
food value	H 250, 255
husking	H 294
peeling	H 294
pokeweed roots, cooking	A 58
preparation for selling	G 369
scraping	H 294
seasoning	H 279
selection of, for cooking	H 271
shelling	H 294
soaking	H 295
stewing	H 280
<i>See also</i> names of vegetables; e. g., Cauliflower; Parsnip; Pump-	
kin; etc.	
Verbena	
characteristics	G 332
planting	G 84
Village improvement	
books about	A 518
what boys and girls can do	A 469-472
Vinegar	
cider vinegar	
book about	A 518
making	A 412-417
"mother," meaning	A 415
Vinegar cruet	
washing	H 183
Vines	
annuals	G 359
climbers	G 359
for covering fences and buildings	G 138
scarlet runner bean	G 297
training	G 139
use in landscape gardening	G 359
Violet	
California, characteristics	G 333
habits and characteristics	G 346, 364
insect pests	G 293
Russian, characteristics	G 333
tufted, characteristics	G 334
where to plant	G 346
wild varieties	G 346

	PAGE
Vireos	
insect destroyers	A 456
migration	K 176
Virginia creeper	
decorative value	G 359
Vise	
bench vise	M 6*, 21*, 22*
quick action	C 138
Voisin's biplane	B 173-175*
Volley ball	K 390
Volta, Alessandro	E 90
perfected method for producing electricity by chemical action	E 248
Voltmeter	
for direct and alternating currents	E 93
measuring electric pressure	E 39-42
multipliers	E 92
principle and operation	E 84-93*

W

Waists. <i>See</i> Dressmaking	
Waiting on table. <i>See</i> Meals — Serving	
Waitress	
dress	H 173
duties	H 169-172
Wake robin	G 344
Walking	
healthfulness of.	K 14-17
Walking stick	
carved by the engraver beetle	A 60
orange wood	A 59
roots for handles	A 60
shaping	A 61
Walks. <i>See</i> Cement walk; Garden paths	
Wall brackets. <i>See</i> Brackets	
Wall cabinet. <i>See</i> Medicine cabinet	
Wall flower	
characteristics	G 332
Wall paper. <i>See</i> Walls	
Wall rack. <i>See</i> Book rack	
Wallachian embroidery	
drawing scallops	N 135
meaning of	N 134
stitch.	N 134*
Walls	
care of	H 122
cleaning appliances	H 142
cleaning wall paper	H 123
decoration of	D 36, 39-41, N 76
dry cleaning	H 332
how to drive nails into plaster walls	C 246

	PAGE
Walls— <i>Continued</i>	
kitchen	H 189
paneled walls, cleaning	H 122
<i>See also</i> Embankments; Paper hanging	
Walnut	
black	
characteristics of tree	C 563
imitation stain	C 489, D 230
device for husking	A 36
drying and storing nuts	A 35
food value of nuts.	H 256
receipt for pickled walnuts	A 36-37
white, characteristics of tree	C 564
Wandering Jew	
window box plants.	G 193
Warbler	
insect destroyer	A 456
Wardrobe. <i>See</i> Closets, Clothes	
Warning (Game)	K 391
Warp. <i>See</i> Weaving	
Wash board and wash boiler	
care of	H 313
Washing. <i>See</i> Laundry work	
Washing dishes. <i>See</i> Dish washing	
Washington (Game).	K 392
Washington thorn	A 23
Washstands	
cleaning	H 148
used as playhouse	H 8
Wasps	
development from the egg	A 393-395
feeding grub	A 391
habits	A 390-391
Waste	
classification.	H 220
disposal of	
in country	H 222
in cities.	H 220-222
Waste pipes	
care of	H 156
construction principle	H 216-217
disinfection in cleaning	H 218
misuse of	H 220
Waste water	
disposal of	H 216
in country	H 222
Watch fob	
copper and enamel.	D 353-355*
silver or copper work	M 187-190*
Watches	
balance and spring	B 374

	PAGE
Watches— <i>Continued</i>	
Geneva stop	B 319*
magnetized	B 373-375
mechanism	B 80, 374
non-magnetic	B 375
regulators	B 330-331*, 374
testing for magnetism	B 375
Watchman's time detector.	E 78*
Water	
boiling point	H 277
cold water as a preserver	H 357
substitute for milk.	H 357
Water and bog plants	
table	G 366
Water bugs	H 362
Water bulbs. <i>See</i> Bulbs	
Water closets. <i>See</i> Closets, Toilet	
Water fowl	K 181
Water garden	G 362
Water glass	
egg preservative	A 177
Water life.	K 158-167
collector's net	K 158*
telescope for observing	K 159
Water lilies	
table	G 366
Water meter	
vibrating trough	B 343*
Water mint	
characteristics	G 366
Water motor. <i>See</i> Water wheels	
Water pipes. <i>See</i> Plumbing; Waste pipes	
Water polo	K 392
Water power	
estimating	E 220
from a continuous fall of water	B 341*
reclaiming a spring	A 281-282
<i>See also</i> Water supply; Water wheels	
Water race	K 393
Water seal	
construction and purpose	H 217
Water supply	
importance of source	H 213
principle of the tower.	H 215
spring water	A 276
summer camp devices	E 160-162
theory of U-tube in waterworks	H 214-215
Water tank. <i>See also</i> Pumps; Water wheels; Wells	
electric warning for empty tank	E 302*
Water tax	
economizing bills	H 236

	PAGE
Water wheels	
ancient	B 344*
Archimedian screw principle	B 344*
barker or reaction	B 343*
breast wheel	B 341*
governors	B 314-315*
overshot	B 341*, 342
undershot	B 341*
vacuum cleaner motor	B 381
volute wheel	B 342*
<i>See also</i> Turbines	
Water works. <i>See</i> Water supply	
Watermelon	
food value	H 255
germination per cent.	G 233
planting	G 308
Watt, James	
inventor	E 40
Watt	
unit of power	B 125
<i>See also</i> Kilowatt	
Wattmeter	E 35-42
illustration of motor principle	E 36
measuring watt hours	E 40-41
registering amount of electricity used	E 37-38
Wax	
bayberry dips	A 20-21
grafting	G 256
making beeswax	A 323
wood finish	C 490, D 225-226
<i>See also</i> Floors	
Wax beans	G 297
Wax myrtle	A 18-19
Waxwings.	
insect destroyers	A 457
Weasel	
colors of fur	A 495
habits	A 494
Weather	
records, how made.	B 362-363
symbols	B 361-362
<i>See also</i> Barometer; Rain; Thermometer; Weather vane; Wind	
Weather boarding. <i>See</i> House framing	
Weather vane	
making	C 154-168*
Zeppelin airship weather vane, making	C 165*
Weathered oak finish	D 233
Weathering	
meaning	B 41
Weaving	D 244-279, N 296-305
bordered table scarf	D 273-276

	PAGE
<i>Weaving—Continued</i>	
color effects	N 304-305
curtains and draperies.	D 262-265
dowel.	N 297
dyeing, materials for	D 276-279
French as weavers	N 303
hand loom	
bridge	N 299
description of treadle loom	D 247-249*
home-made, without treadle	N 296-297
primitive loom	D 245
setting	D 249-251, N 297-300
shuttle and bobbin	D 246*
shuttle for woof cloth	D 254
simple cardboard loom	N 8
materials to use	N 301
pattern weaving	D 265-273
drawing in the pattern	D 267-270*
hit-and-miss pattern	N 302
operation of the harnesses	D 270-272
pick	D 271*
variations in patterns	D 272, 275
portieres and couch covers	D 260-262
process	D 249-252, N 300-301
beating up the woof	D 252, N 300
drawing in the warp	D 251, N 300
pairing threads	N 298
preparing the warp	D 249, N 297
warping the loom	D 250, N 298
rattan mats	N 247*, 249
rugs	D 252-260, N 297-303
harmonizing effects	N 304
tapestry designs.	N 303
warp and woof	D 246, N 8-9*
warping hook	D 251*
<i>See also Braiding</i>	
<i>Wedge</i>	
cutting tool	C 169
principle of	B 59-61*
rule for power	B 64
<i>Weeds</i>	G 271-280
annuals, destroying	G 275
biennials, destroying	G 276
book about	A 519
definition of	A 469
destroying and preventing	A 469-472, G 275-279
distribution of seeds	G 273
foreign	G 279
good points	G 272
medicinal	A 57-58, G 272
book about	A 516

	PAGE
Weeds— <i>Continued</i>	
perennials, destroying	G 276-277
propagation	
seeds	G 274
trailing branches	G 275
table of	G 278
test of acid soil	G 29
Weevils	
chestnut weevil	A 33
Weigela	
characteristics	G 356
Weight	
principle of lifting	B 23-28*
Weights and measures	
English versus metric system; tables	C 500, 502
tables	H 311
units of measurement	C 499, 502
<i>See also</i> Electric measurements	
Welding	M 247-263*
built-up work	M 247
butt welds	M 257*
definition of	M 247, 315
chains	M 250-253*
cleft weld	M 258*
corner plate	M 261*
electric	E 158-159
flat welds	M 254-257*
flat welds and T-welds	M 261-263*
horse shoes	M 221
iron oxidation, preventing	M 247
iron ring	M 248-250*, 254*
iron tongs	M 287-288*
jump weld	M 259-261*
kinds	M 254
lap weld	M 258*
scarfing	M 254-256*, 258*
a wrench	M 275*
socket wrenches	M 277-281*
T weld	M 262-263*
temperature of fire	M 234-235
tool steel to wrought iron	M 352
turn buckles	M 330*
upsetting	M 260*
Wells	
location and care	H 214
<i>See also</i> Pumps	
Western Union Telegraph Company	
equipment and amount of business.	E 60
Whale oil soap	
spray for insects	G 289, 290

	PAGE
Wheat	
depth to plant seeds	G 235
Wheel and axle	
principle of	B 27, 78-82*
rule for power	B 64
Wheel-barrow	
leverage principle	B 27
making	B 375-378*
Wheels	
mechanical movements	B 318-325*
<i>See also</i> Screw propeller; Turbines; Water wheels	
Whip grafting. <i>See</i> Grafting	
Whisk broom	
raffia	N 275*
White pine. <i>See</i> Pine	
White rabbit. <i>See</i> Rabbit	
Whitewash	
preparing surface walls	H 340
preparing the lime	H 339-340
value for cellar walls	H 210
Whittling	C 6-22
beveling	C 122
calendar back	C 18*
curves, cutting	C 15*
cutting out process	C 12*
drawing the design	C 12*
first lessons in	C 9-12*
fish line winder.	C 15*
key rack.	C 12-14*
key tags	C 14*
knife	
kind to use	C 6*
method of holding	C 8*
paper knife	C 121-123*
picture frames	C 19-22*
propeller blades	C 70-72*
sand papering edges	C 15
testing with the try square	C 9*
tip cat	C 35-37*
weather vane making	C 154-156*
windmills	C 159-168*
woods for	C 7
worsted winder	C 16*
<i>See also</i> Wood carving	
Wicket polo	K 393
Wicks	
trimming.	H 137
Widow's cruse of oil: story	H 29
Wild animals. <i>See</i> Animals	
Wild carrot	
class and seed time	G 278

	PAGE
Wild carrot— <i>Continued</i>	
seed distribution	G 273
Wild crabapple	A 21, 22
Wild flower gardening	
April, June and July blooms	G 338-339
decorative value of wild flowers.	A 56
landscape gardening	G 362
late blooms	G 339
March blooms	G 338
May blooms	G 338
planning and care	G 336
soil	G 337, 338
succession of bloom	G 338-339
transplanting	G 337
Wild flowers. <i>See</i> Flowers	
Wild fowl. <i>See</i> Game and game birds; Water fowl.	
Wild geranium	
characteristics	G 342
Wild grapes. <i>See</i> Grapes	
Wild nuts	
list of	A 29
Wild plums	
“goiñ, plummin”	A 26-29
Wild raspberries	A 10
Wild rice	A 78-79
Winch	
setting up	B 77-78*
uses	B 78-81
Wind. <i>See</i> Winds	
Wind break	
trees for	G 79, 82
Wind flower	G 343
Wind root	G 348, 365
Windlass	
principle of	B 78-82*
Windmill	
common windmill	B 346*
happy Jack weather vane	C 159-162*
horizontal weather vane	C 162-165*
six-bladed weather vane	C 167-168
Zeppelin weather vane	C 165*
Window-box	
advantages over pots	G 190
construction and painting	G 191-192
crowding plants in	G 194
draining	G 163
how to fasten to window.	G 195
selection of plants for sunny and shady windows	G 192-196
Window seat for girl's room	N 374
Windows	
batten blinds	C 475

	PAGE
Windows— <i>Continued</i>	
cleaning	H 134
details of window frames	D 30*
hanging	C 474
inside trim	C 473*
location of cellar windows	H 208
setting frames	C 469
Winds	
measuring device	B 199-200*
table of velocity	B 198
<i>See also</i> Weather vane; Windmill	
Winter sports	K 208-224*
clothing and footwear	K 208-210*
Winterberries	
description of	A 57
Wire	
reducing size of	M 101
<i>See also</i> Electric wires	
Wire ropes. <i>See</i> Rope	
Wireless Club	E 331-332
Wireless Telegraph	
accidents prevented by	E 347, 355-357
aerials	E 331
amateur stations	E 347
antennæ	E 320*
C. Q. D. message, meaning	E 356
coherer	
circuit	E 323*
construction	E 316-321*
discovery	E 346
electric bell	
as transmitter	E 321
operated by wireless	E 324*
ether waves	E 316
fireworks, operated by	E 327-328*
first company organized	E 346
first practical use	E 346
first public stations	E 347
ground wire	E 321
Hertzian waves	E 346
incandescent lamps operated by	E 327*
law requiring use on steamers	E 347
Morse alphabet	E 330
operation of a simple type	E 320-321*
relay	E 322-323
sending messages to ocean steamers	E 347
signal code	E 330
spark coil, construction	E 321-322*
tapper	E 329-330*
toy train operated by	E 325-327*
trans-Atlantic messages first sent	E 346

	PAGE
Wistaria	
decorative value	G 359
Witch hazel	
characteristics	G 356
Wolf and sheep (Game)	K 394
Women	
Heritage of	H 63-68
home making power	H 44
Wood	
best woods for special purposes	K 101
decay, cause of.	C 492
durability	C 492-494
hard wood	C 532, K 101
beech	C 556
black jack or barren oak	C 554
black or sweet birch	C 557
black or yellow oak	C 554
bur oak (mossy cup)	C 551
chestnut oak	C 552
cypress	C 540
elm, white or American	C 559
Georgia pine	C 535
holly	C 564
honey locust	C 565
hop hornbeam, ironwood	C 558
hornbeam, or blue birch.	C 559
larch	C 539
laurel oak	C 555
locust, black and yellow	C 565
paper birch	C 558
pin oak	C 553
post or iron oak	C 552
red birch	C 557
red elm, slippery elm	C 559
red oak.	C 553
red or swamp maple	C 547
red pine	C 536
rock, cork elm	C 560
silver, or white maple	C 546
sugar maple	C 545
swamp white oak.	C 552
tamarack	C 539
white oak	C 550
willow oak	C 555
yellow birch	C 557
yellow pine	C 536
preservation	C 493-495
soft wood	C 532, K 101
Arbor vitæ	C 542
balsam	C 540
basswood, linden	C 560

	PAGE
Wood, soft wood — <i>Continued</i>	
black spruce	C 538
box elder	C 548
buckeye.	C 565
fir	C 540
gray, or aspen-leaved birch	C 558
hemlock	C 539
moosewood.	C 548
mountain maple	C 548
pitch pine	C 536
red cedar	C 541
red spruce	C 538
white cedar	C 542
white pine	C 535
white spruce	C 538
strength of	C 495-497*
<i>See also</i> Forestry; Kindling wood; Trees	
Wood anemone	
habits and characteristics.	G 343
Wood carving	
black and white design	C 127
blotter pads, designs	C 125-126
chip carving	C 98-108*
curved cutting	C 104-108
designs	
elliptical.	C 112-115
for borders.	C 98-103*
for centres	C 103-108*
for corners	C 103*
flat work.	C 97-119*
glove box design	C 128
holding the knife	C 100*
key rack designs	C 123, 126
knives for carving	C 99*
letter racks, designs	C 109-117
origin.	C 98
paper knife	C 121-123*
pencil box	C 106-108*
penholder	C 117-119*
picture frames	C 129-132*
polishing	C 131
triangular cutting	C 98-99
veining	C 117*
woods for	C 121
Wood finishing	
aging wood	C 489
antique finish	C 489
cleaning, the first step	D 213
colors, obtaining	C 488
dead flat surface	C 485
dull finish	D 224

	PAGE
Wood finishing— <i>Continued</i>	
enameling white	D 235
fillers	C 484
cost of surfacing	D 217
liquid, formula	D 216
importance of	D 213-215
paste, formula	D 218
applying	D 219
when to use liquids or paste	D 215
flat finish	D 224
polishing	C 489-491
process	C 484-487
re-finishing	
old furniture	D 238-243
mahogany table	D 241-243
rubbing down process	D 223
scraping	D 239
shellac, using	C 486, D 216-217
varnish, removing	D 240
wax finish	D 225-226, C 490
white enamel	D 235
white wood	D 230
woods that do and do not require fillers	C 484
<i>See also</i> Stains and staining; Varnish and varnishing	
Wood fire. <i>See</i> Fires	
Wood lot	
clearing for kindling wood	A 407
Wood screws	
strength of	B 156
Wood staining. <i>See</i> Stains and staining	
Wood tag.	K 394
Woodchucks	
taming	A 269
trapping	A 488
Woodcraft	K 93-109*
axemanship	K 96-97
getting lost	K 102-109
land marks	K 103
lost signals	K 108
<i>See also</i> Trees	
Woodpecker	
insect destroyer	A 457, K 168
Woodwork. <i>See</i> Carpentry and Woodwork	
Woof. <i>See</i> Weaving	
Wool combing machine	
roller motion	B 320*
Woolen clothes	
laundering	H 324
storing	H 347
Work. <i>See</i> Housekeeping; Occupations	
Work bag and sewing apron combined	N 31-33*

	PAGE
Work bench. <i>See</i> Carpentry	
Work shop	
garden tool making	G 41-71*
<i>See also</i> Carpentry	
Worms	
fish bait	K 130
Wren	
insect destroyer	A 456
migration	K 176
Wrench	
alligator wrench, making	M 276*
flat wrought iron wrench, making	M 274-277*
forging	M 273-274*
hardie for	M 274*
socket wrench	M 279-281*
welding	M 277-279
Wringer for laundry work	H 314
Writing desk. <i>See</i> Desk	
Wrought iron	
making	M 230-232
steel versus	M 266
X	
X-ray	
ether waves	E 316
physiological effect	E 336
Y	
Yachts	
flag signals	B 107-109
<i>See also</i> Launch	
Yeast	
principle in bread making	H 296-298
Young, Sir Thomas	
ether wave theory of light	E 345
Z	
Zeppelin's dirigible balloon	B 162
Zinnia	
characteristics	G 328
planting	G 159
selecting seeds	G 323



ELECTRICITY AND ITS EVERYDAY USES

HOUSEKEEPING

OUTDOOR WORK

NEEDLECRAFT

HOME DECORATION

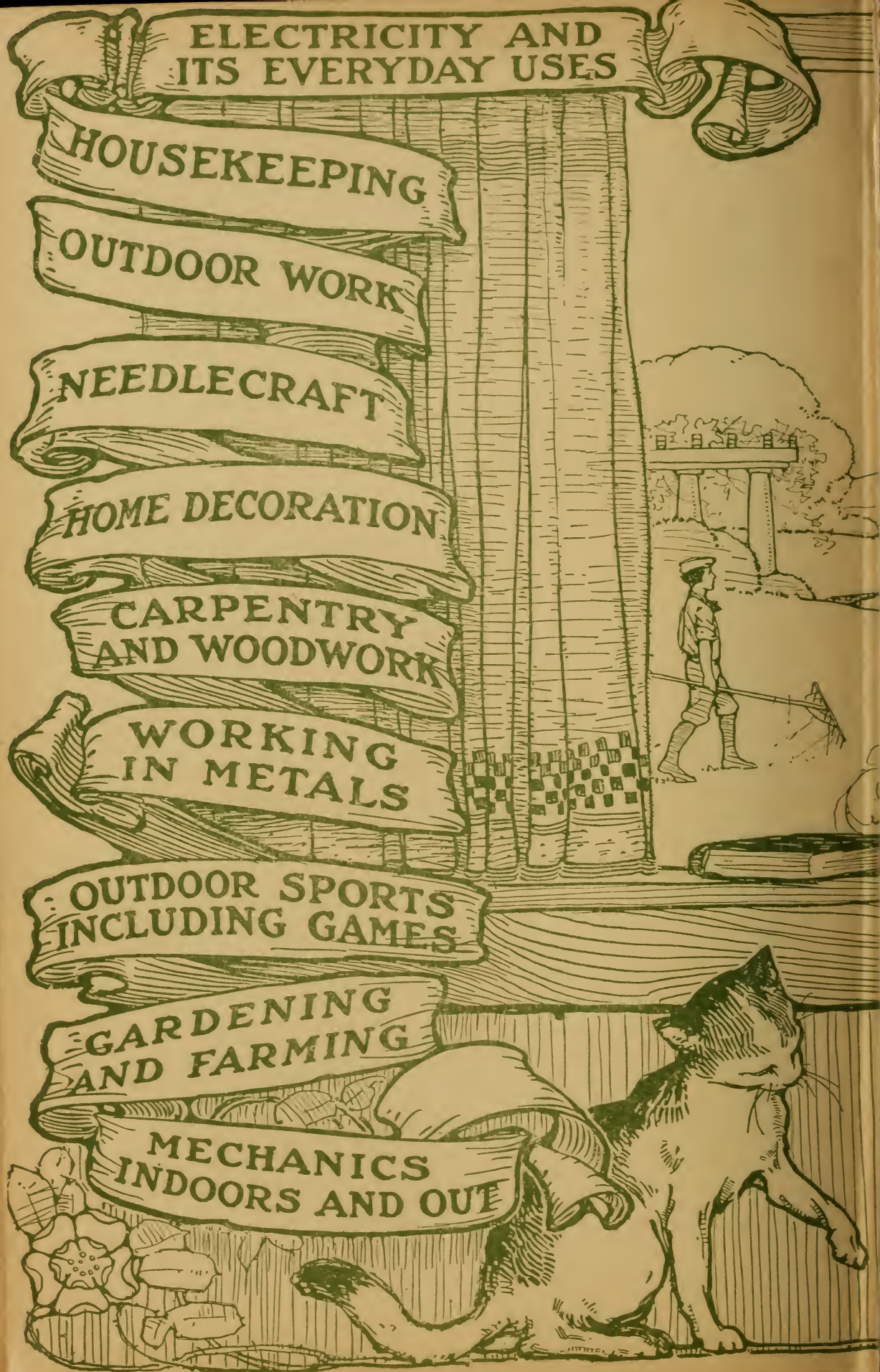
CARPENTRY
AND WOODWORK

WORKING
IN METALS

OUTDOOR SPORTS
INCLUDING GAMES

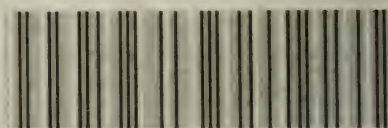
GARDENING
AND FARMING

MECHANICS
INDOORS AND OUT





LIBRARY OF CONGRESS



0 013 971 248 1 •